A HANDBOOK OF ORCHESTRATION

BY

FLORENCE G. FIDLER

With musical illustrations in the text and 4 Compass Charts.

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TO

WINIFRED E. HOUGHTON

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APOLOGIA

The paramount need in music teaching at the present time is the training of students as listeners. In order to listen intelligently one must understand the language that is spoken. The principal language of the music of to-day is that of the Orchestra. An intimate knowledge of the grammar of orchestration is, then, the necessary technical equipment of the intelligent listener. The best way to attain this knowledge is by writing orchestral scores, which should in no case be original composition, for one cannot learn the grammar of a language and write poetry in it simultaneously.

Twenty years experience of teaching orchestration on these lines—by orchestrating piano-music already in existence, without reference to other branches of musical theory—has convinced me that good listeners can be produced in this way; and that all students, particularly singers and pianists, can be aided thereby towards sound musicianship. Incidentally, if a student is at the same time working through the ordinary academic routine of musical theory which results in composition, by the time he arrives at that goal he has already at hand the technical knowledge of the Orchestra which enables him to transcribe his ideas directly to the Full Score.

My pupils have repeatedly urged me to put into book-form the notes that I give them, but hitherto I have refrained from doing so because there are already so many

good text-books published. But Orchestration is a subject which is always changing and growing, so the best book inevitably gets out-of-date in a short time. This continual change is due to the development of Music itself, which—like other art forms—tends all the time to become more complex, and more difficult to execute. This gives rise to a constant demand for instruments more capable of grappling with the technicalities of the modern score. Instrument-makers rise to the occasion, and though the Strings are in the main static, the wind and percussion instruments are constantly improved in mechanism. This, then, is my apology for adding another manual to those already in existence.

In conclusion I wish to acknowledge my great indebtedness to Mr. Cecil Forsyth, whose exhaustive volume, *Orchestration*, has been invaluable to me. I trust that every student who has worked through this little book with advantage and pleasure will pass straight on to the great work in which Mr. Forsyth has formulated his vast knowledge of an intricate subject.

FLORENCE G. FIDLER.

FOREWORD TO STUDENTS

Students without any knowledge of Harmony and Counterpoint are assured that, although such knowledge is of immense service in Orchestration, it is not *necessary* until the scores become well advanced. Good elementary orchestration only requires acquaintance with the "elements" of music (keys, time-signatures, etc.) and a working knowledge of transposition.

The best method to follow is to study Harmony side by side with Orchestration, thus developing the tonal colour-sense simultaneously with that of structure and design. The unfortunate method of postponing the study of Orchestration until the final stage of a prolonged course of theoretical training in music is reached is equivalent to forbidding a child to colour pictures until he can draw correctly.

The two Parts of this book are to be used concurrently, and the student also requires copies of the Piano music and orchestral scores listed on Page 7. The graded course of study is the result of long experience in teaching the subject. String writing, correct but not necessarily elaborate, must be mastered

first, as it is the fundamental basis of all orchestration. The student is advised to study thoroughly each Section (of Part I) before going on to the next ; it is the quickest in the end, and nothing is gained by trying to learn all at once the details of many intsruments. Concentration on one point at a time is the aim of this system, which is only intended to start the student on the right road—a road which has no end !

No detailed description of the instruments has been given as it is obvious that unless the student knows them already by sight and by sound he cannot hope to achieve much. Tone colouring, like picture colouring, cannot be taught in words, and any endeavour to describe sounds generally results in absurdity or incoherence. The ear can only be trained by constant listening to an orchestra, first of all concentrating on single instruments and on groups, and then studying the more complex sounds of their various combinations. The student must not be satisfied until he can hear mentally every score he reads or writes.

All statements relate to English methods and instruments only, and historic information has been rigorously excluded. The growth and development of musical instruments is a sub-

ject of immense interest, but it has no bearing whatever on the study of elementary orchestration, and had better be deferred until later. Students who wish to pursue this branch of the subject are referred to the Bibliography at the end of this volume. The methods of the most modern composers are also omitted as being too complicated for the beginner, who is assured that if his foundations are sound he will find little difficulty in embellishing his scores later with the most recent ornamentation.

It is unwise to obscure the plan of a text-book such as this by the introduction of controversial matter: the directions and statements therefore have been made intentionally dogmatic. Students who discover numerous exceptions and side-issues must be generous enough to remember this.

In addition to the use of this book, and the music to be studied in connection with it, the student should (1) attend every orchestral concert possible, and always sit where he can *see* the players well; (2) cultivate from the first the habit of playing from score; he should play all the scores he writes and as much as he can of those chosen for study; (3) copy out one or more full scores from the set of separate orchestral parts; (4) score some well-known

orchestral work from the piano arrangement, and then compare his own version with the composer's original; (5) study every full score he can get hold of, when possible noting in a piano version (with red ink and a privately invented shorthand) the details of the scoring; (6) play some orchestral instrument, be it only Triangle or Bass Drum, in order to obtain practical experience in orchestral methods. *Apropos* of this it may be added that wind instruments are on the whole easier to play than strings, and are more in demand in amateur orchestras.

LIST OF THE MUSIC TO BE USED WITH THIS BOOK

FULL SCORES

Beethoven. Symphony in E flat, No. III (Eroica)

Mendelssohn. Five Numbers from the *Midsummer Night's Dream Music.* (*Scherzo, Intermezzo, Nocturne, Wedding March, Rupeltanz*)

Tschaikowsky. Suite. *Casse Noisette,* Op. 71.

Tschaikowsky. Symphony, No. VI (*Pathétique*) Op. 74.

PIANO MUSIC

Mendelssohn. Lieder ohne Worte (Any complete edition)

Beethoven. Piano Sonatas

Borch. Petites Pièces caractéristiques. Op. 49. Bk.I (Augener)

Farjeon. Night Music. (Seven Pieces) (Augener)

Rachmaninoff. Serenade. Op.III, No. 3 (This is included in several albums of short pieces)

Grieg. Humoresken, Op. 6.

ABBREVIATIONS

In order to save space in the text, the four full scores are referred to as *Eroica, M.N.D., Suite,* and *Path. Sym.* The page numbers are those of the miniature edition. (The Donajowski Edition, now published by Messrs. Feldman & Co.) The initial "M" signifies "Movement." In the piano music the composer's name only is given, with the number of the piece in the collection.

GENERAL INTRODUCTION TO THE SUBJECT

The Orchestra is divided into three Groups —Strings, Wind, and Percussion. Wind and Percussion parts are never duplicated—that is, there is only one player for each part ; String parts are performed by several players together.

The Strings form the body of the orchestra, and can never be done without for very long. This is because (1) they have the greatest range in execution as regards rapidity, expression, gradation of tone, and the facility with which they can accomodate themselves instantly to any musical idea : (2) as they use their hands only, String players do not tire so quickly as do Wind players, and can play continuously : (3) the tone of the Strings does not pall on the ear so soon as the tone of the Wind.

Dr. Riemann has pointed out that whereas the Strings must always give the form and general character of the music, the Wood Wind adds a free statement of definite ideas, and the Brass proclaims those ideas : to this may be added the suggestion that the Percussion clinches the matter.

A little thought will show that musical instruments follow the general scheme of Nature's Laws: big things have deep voices, little things have high voices: big things talk slowly, little things talk quickly. So in the Orchestra the larger the instrument, the deeper its note, and the greater its difficulty in playing fast. The largest and the smallest instruments have the least power of expression, and (in the Wind Group particularly) it is the middle sized instruments that are the best suited to solo work.

The modern arrangement of the parts in a Full Score is Wood Wind at the top, then Brass, then Percussion, with the Strings at the foot, the instruments of each group, being placed, roughly, in their order of pitch. As String writing must be studied first it is necessary to begin the study of the Score at the bottom. The Violoncello and Double Bass parts must, now, always be written on separate staves and this arrangement of five staves for the Strings rigidly adhered to until such time as extra ones are required for the subdivision of parts. The two parts of each pair of Wind instruments are always placed on the same stave, and care must be exercised in the matter of tails and rests; the tails of all notes

to be played by the First being upward, and those of the Second downward, irrespective of their positions on the Stave. Double rests must be inserted, except in those bars where both are silent ; it is allowable, however, (1) when only one of the pair is playing for a long time, to write "1mo" or " 2do " at the beginning of the passage, and (2) when both are in unison for some time, to write the term " unis " in order to save space.

Orchestral writing must invariably be a matter of artistic nicety and exactitude, with no details left vague or unexplained. The success of a score depends very greatly on the clarity of its independent parts, every one of which should be complete in itself, having its own phrasing, expression marks, etc. It is wise to rule the bar-lines for the whole score before beginning to work, and to write in all the clefs, key-signatures, etc. : also to number the bars and those of the piano copy of the piece to be scored. It is not necessary to begin a score at the beginning, the better plan being to work the easiest parts first : in every case the whole plan of the score should be sketched out before any details are filled in.

Every pupil demands to be told sooner or later why he is troubled with transposing

instruments. Briefly, the reason is this :—in the case of these instruments the choice lies between making things easy for the writer of the score and the conductor of the orchestra on the one hand, and on the other making things easy for the players of the parts, either by similarity of fingering to that of a kindred instrument (as in the case of the Cor Anglais), or by the avoidance of *leger* lines (as in Double Bass), or by a less strenuous mental effort (as in Horn) : there is only one writer and one conductor to a number of players, and both writer and conductor are entirely at the mercy of the players ; therefore it pays in the long run to make things as easy as possible for them at the expense of everybody else. Moreover, as Professor Prout points out, every student must learn to read parts written in the accepted fashion, or the whole of orchestral literature will be closed to him, and there is nothing gained by reading scores in one way and writing them in another.

The choice of key is not so important a matter as it formerly was, but all instruments are more resonant and have easier parts in those keys which have few sharps or flats. Other things being equal it is better to take a flat key than a sharp one. Horn and Trumpet players

are so accustomed to transposing that they usually prefer to do it than to find a part written with many sharps and flats.

A part should not only be made easy for the player, but interesting also : a dull part never gets well played, and whatever is needlessly difficult, fussy, or irritating is sure to sound ineffective. Every part should be so "grateful" in itself that it is a pleasure to play it through alone. Students should write as a rule for the average player, neither for experts nor beginners. Although difficulties are diminishing both as regards the mechanism of the instrument and the technique of the player, good orchestration still consists in writing for every instrument that which is strictly in accordance with its character and temperament : exaggeration of any kind is an artistic mistake, and may easily become a vulgarity.

EXPLANATION OF COMPASS CHARTS.

The notes on the stave at the top of the Chart represent the real sound of each note shown beneath: all other notes in the Chart are those *written* for the respective instruments.

STRINGS. The four open strings of each instrument are numbered and written in semibreves; the suggested top stopped note as a minim. The lowest artificial harmonic obtainable and the highest advisable appear as crotchets with a diamond-shaped note above. Natural harmonics are marked as black dots without tails; it must be understood that others are scientifically possible but undesirable in an orchestral score. It will be noted that in each case the sound of the lowest artificial harmonic can also be obtained as a natural harmonic. The same relative harmonics are given to the Viola as to the other Strings, but the student is referred to the Section on the Viola in Part II, (Par. 4).

WIND. The system followed is to regard the semibreve as representing the most perfect note, and the demisemiquaver as the most imperfect, and to show the intervening gradation by means of the relative note-values; so the best

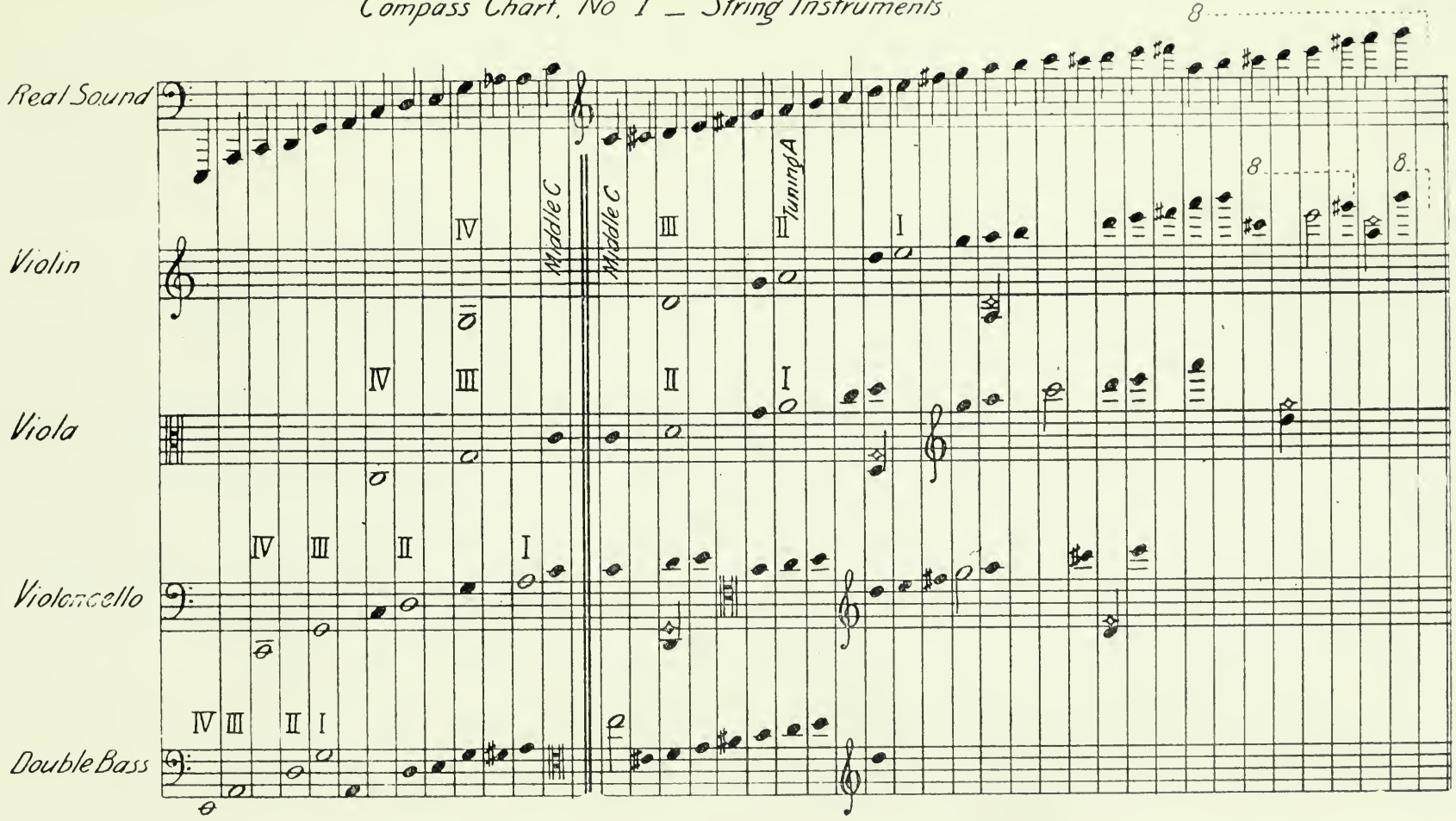
part of each instrument is that enclosed between two semibreves. The Pedal Notes of the Tenor Trombone are shown with diamond-shaped heads and the letter P over each. Four separate staves are allotted to the Trumpet, because its notation is not yet standardised: there is of course no instrument called "Trumpet in C" but a moderate compass without transposition has been included under this title as a guide to beginners, who invariably find the Trumpet the most difficult of the transposing instruments to write for at first. The two notes in brackets in Double Bassoon are only to be found on certain makes of instrument.

PERCUSSION. The extreme notes of the four Kettledrums in common use are given: the size of the Middle Drum varies, so both sorts are represented. In Harp, Glockenspiel, etc. the system of graduated note-values (as in Wind) is followed. The smallest Glockenspiel compass is quoted: but all these mechanical instruments are so various in kind, and so continually changed and improved that no final word on their construction is possible.

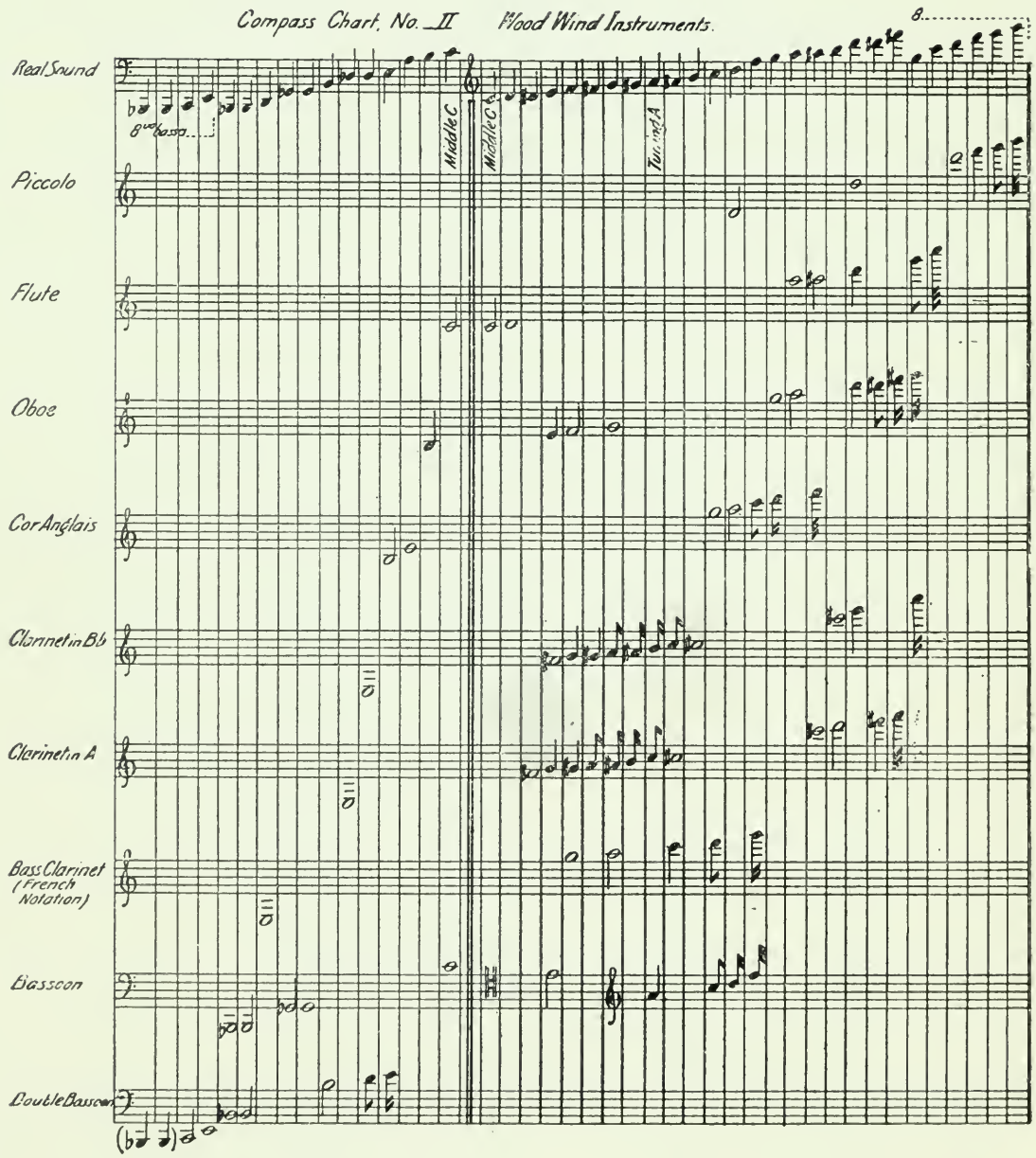
It must be understood that these Charts are only intended to serve as a rough guide to the beginner. The compass (especially the upward compass) of most musical instruments is indeter-

minate, depending to a great extent on the make and quality of the instrument, the ability of the player, and the conditions of the moment. Extreme notes are always best avoided.

Compass Chart, No I — String Instruments



[face p. 14


Compass Chart. No. II Wood Wind Instruments.
Real Sound
8va bassa
Middle C
Middle C
Piccolo
Flute
Oboe
Cor Anglais
Clarinet in B♭
Clarinet in A
Bass Clarinet (French Notation)
Bassoon
Double Bassoon

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PART I: THE SCORE.

A GRADED COURSE OF STUDY.

CHAPTER I: The String Orchestra 17

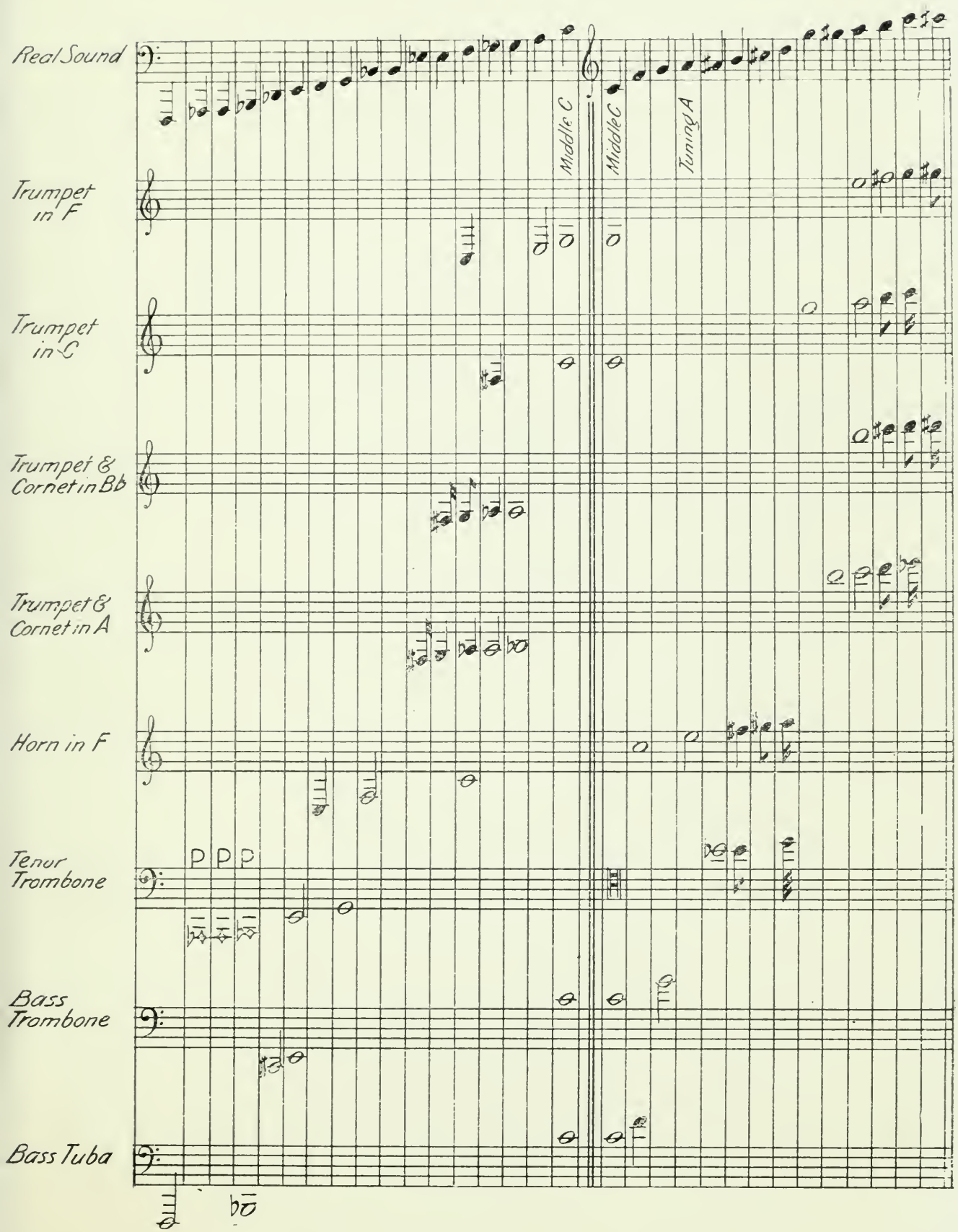
CHAPTER II: The Wood Wind 23

CHAPTER III: The Small Orchestra 27

CHAPTER IV: The Full Orchestra 31

CHAPTER V: Notes for Advanced Students 34

Compass Chart. No. III Brass Wind Instruments



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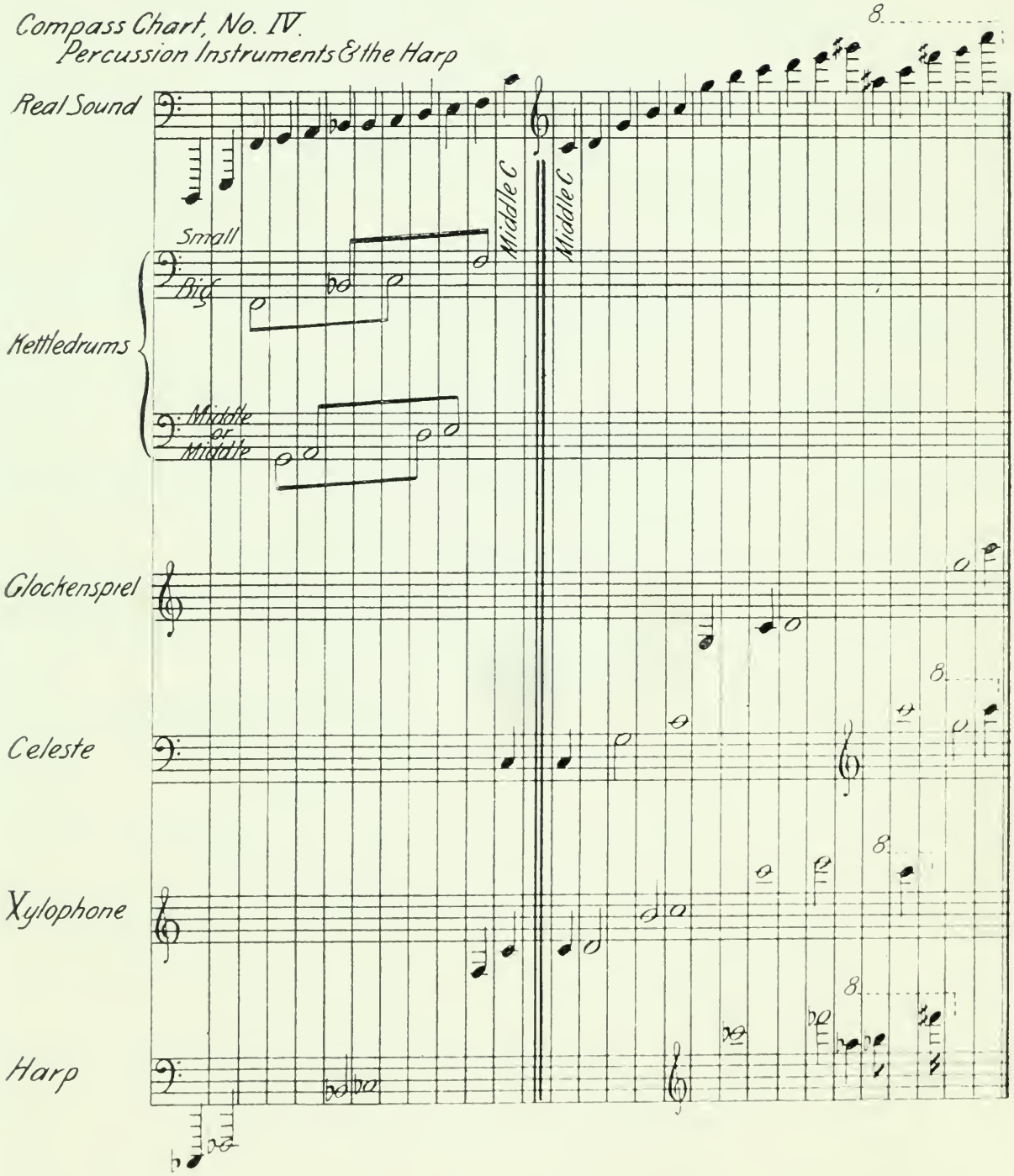
Compass Chart, No. IV.
Percussion Instruments & the Harp
Real Sound
Middle C
Middle C
Small
Big
Kettledrums
Middle
or
Middle
Glockenspiel
Celeste
Xylophone
Harp

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PART I: THE SCORE

A GRADED COURSE OF STUDY.

CHAPTER I. THE STRING ORCHESTRA

SECTION I

STUDY. *Part II*, Ch. I, 1-5; and Chap. II, Sec. I. Refer also to Sections 2, 3, 4,

Eroica; M. 2 (Funeral March) String parts only.

SCORE. *Mendelssohn*, No. 48 (Op. 102, No. 6) for Strings.

No. 9 (Op. 30, No. 3) for Strings, omitting the First and last bars which contain arpeggios.

NOTES. I Rule MS. music-paper into lines of five staves each, joining them with a brace on the left-hand. Allot one stave to each instrument, placed in order of pitch, as follows:

First Violin,
Second Violin,
Viola,
Violoncello,
Double Bass.

The two violins, like women's voices, sing in two parts; the "second" is the one which plays the lower part.

2. Each of the five parts must be complete in itself, having its own clef, key-signatures and expression marks; but directions which affect the time of the whole (such as *Allegro, rall*). need only be inserted at the top of the score. (*Eroica,* 82).

3. It is not necessary to keep every instrument playing continuously. (*Eroica,* 100, 117, 121).

4. Any note can be given to any instrument provided it is within its compass: the First Violin need not always be at the top. (*Eroica,* 118).

5. The tune should bear the same position in regard to the whole as in the original: the bass may never be altered, except in octave; it must always remain at the bottom of the harmony.

6. Notes may be doubled in two or more parts. (*Eroica,* 105, 107).

7. Nothing may be added to the harmony; *e.g.* a common chord must remain a common chord, and have no seventh added to it.

8. The instrument that begins a sentence should finish it, as in speaking.

SECTION II

STUDY. *Part II*, Ch. I. 6-10; and Chap. II, Sec. 3.
Eroica M. 3 (*Scherzo*) String parts only.

SCORE. *Borch*, No. 2, *Sarabande*, for Strings.
Mendelssohn, No. 45 (Op. 102, No. 3) for Strings.

NOTES. 1. Plan out a scheme for the whole score before beginning to write. The best way is to play it, marking on the piano copy meanwhile the proposed distribution of parts.

2. Every short piece has one big climax: this should be found, written Tutti (everybody playing), worked up to and away from.

3. A score should be sometimes thick with many instruments playing, and sometimes thin with only a few, according to the nature of the music.

4. Learn from the first to regard a score horizontally as well as vertically, and make each part interesting in itself. The best test to apply is to play or hum it through by itself without reference to the others: this will show, among other things, that a phrase which finishes on the beat has the smoothest effect.

5. To discover how fast *pizzicato* can be played on a violin, hold a piece of string between

the teeth and the left hand, and twitch it with the first finger of the right hand, meanwhile singing mentally the passage in question: it cannot be done beyond a certain speed, which is still less in the case of the larger Strings. (Part II, Chap. 1, 7).

3. When doubling the notes of a chord divide them as equally as possible; if there be a remainder strengthen the root of the chord, and then the third.

7. Try always to convey the spirit of the music itself. If a piece is graceful and flowing, write the orchestral parts in long slurred smooth passages; if it is jerky and lively, use short notes and *pizzicato*. The music is to be translated from one language to another, far richer in expression; and the best translations are those which keep the spirit rather than the letter of the original.

SECTION III

STUDY. *Part II*, Chap. 1, 11-13, and Chap. 11, Secs. 2 and 4.

Eroica, M. IV; String parts only.

Suite, Overture Miniature; String parts only.

SCORE. *Mendelssohn*, No. 10, (Op. 30, No. 4) for Strings.

Beethoven, Sonata in E, No. 9, M 1 for Strings.

NOTES. 1. It is most important to have a firm harmonic bass when there are many parts above it to support. When a short note is given in the piano part a long sustained note should often take its place in the score. The guide to this is the use of the piano pedal: in every case where the pedal holds a low note while the left-hand plays a middle part, the bass of the orchestra should hold on likewise. A *pizzicato* bass passage is good for rhythm, but it is not often in itself a sufficiently strong foundation unless another instrument has the same note sustained.

2. Sustained tone in the middle parts is often required, and to this too the pedal is the surest guide. If in the piano part the hands are widely separated, leaving a space in the middle of the instrument without notes, this space should be filled up by means of the sub-division of the Strings into several parts.

3. It is necessary to detach the mind from the limitation of the piano and of the pianist's two hands and ten fingers, and to write according to the greater wealth of material which an orchestra supplies. If a passage is loud, full in tone, and broad in style, parts should be thickened and notes doubled. The orchestra can play that which is impossible to the pianist.

4. The common form of piano four-note arpeggio (Beethoven *Sonata,* Bar 65). is best reproduced in Strings by reiterated semiquavers or bowed tremolo, the chords being spread and divided between several instruments, and the parts sub-divided if necessary. (*Eroica,* 97, 114, and the final *Presto*).

5. If a long passage, or scale, or arpeggio, proceeds through several octaves, and is cut up between different instruments, the smoothest effect can be obtained by careful dovetailing of the joins, leaving no moment of silence. One or more notes should overlap; a good plan is to end one part and start the next simultaneously on the beat. (*M.N.D. Scherzo,* p. 22).

Chapter II. The Wood Wind

SECTION I

Study. *Part II.* Chap. III. The Wind Group, and Chap. IV, Sec. 3, The Oboe.
Eroica String parts of the First M, and Oboe parts of the whole Symphony.

Score. *Mendelssohn,* No. 42 (Op. 85, No. 6) for one Oboe and Strings.

SECTION II.

Study. *Part II,* Chap. IV, Sec. 7, The Bassoon
M.N.D., Intermezzo, Wood and String parts only.
Path. Sym., Bassoon parts only. M.I.

Score. *Mendelssohn,* No. 35, (Op. 67, No. 5) for one Bassoon and Strings.
Mendelssohn No. 18, (*Duetto,*) for one Oboe, one Bassoon and Strings.

SECTION III

Study. *Part II,* Chap. IV, Sec. 1, The Flute.

M.N.D. Wedding March, Wood and String parts only.

Suite, All Flute parts, but particularly those of the Danse des Mirlitons.

SCORE. *Mendelssohn,* No. 12, (Gondellied) for one Flute and Strings: and No. 20, (Op. 53, No. 2) for one Flute, one Oboe, and Strings.

SECTION IV

STUDY. *Part II,* Chap. IV, Sec. 5, The Clarinet.

M.N.D., Scherzo, Wood and String parts only.

Suite, all Clarinet parts.

SCORE. *Mendelssohn,* No. 36 (Op. 67, No. 6) for one Clarinet and Strings.

Mendelssohn No. 28, for Wood Wind only (two Flutes, two Oboes, two Clarinets and two Bassoons.)

NOTES. 1. Wind Instruments must be written for vocally, as if for the human voice, and doubtful points can often be solved by reference to the singer's point of view. For instance, it is as bad to keep a Wind for long on its highest notes as it would be in the case of a singer: and a Wind player must have time to breathe just as a singer must.

2. In writing for one Wind instrument and Strings it is impossible to avoid treating it more or less as a solo part. But when scoring for many Wind together it is a good plan to accompany a Wind solo with Strings, and a String solo with Wind, in order to get the varied tone-colour.

3. In writing a *Tutti* of the eight Wood Wind and Strings the harmony should be complete in itself in each group, so that the Strings by themselves would sound well, and the Wind equally well.

4. If a chord of three or four notes is intended to sound as one whole, with the tone well blended, the best way to get this effect is by giving it to Strings entirely or to Wind entirely. Four-note chords in Wood blend best when given either to Flutes and Clarinets, or to Oboes and Bassoons. Six-note chords blend well with the Flutes and Clarinets crossed and the Bassoons below.

5. There is little gained by giving a solo to the "Second" player in a pair of Wind instruments. The Second's purpose in the Orchestra is (1) to strengthen the part in a loud passage, (*Eroica*, 155); (2) to add notes to the harmony (*Eroica*, 15); (3) to play a duet with the First, such as a passage of thirds or sixths, (*Eroica*,

13, 31); (4) to relieve the First when he needs rest (*Eroica*, 189 and onwards, and 104); (5) to lead up to a passage by the First.

6. It the tune is doubled, the accompaniment must be correspondingly thickened to preserve balance. If the tune is taken up an octave the gap between must be filled. In taking the scoring up in this way it is generally wise to carry the bass down, and thus, by contrary motion, to avoid top-heaviness.

7. In regard to the last score in Sec. IV. (Wood Wind only) it may be pointed out that there are three general ways of obtaining good balance in a Wood *Tutti*: (1) by making the order of parts coincide with the order of instruments on the score; (2) by crossing and interweaving the parts; and (3) by placing the parts of one pair of instruments in between the parts of another pair.

Chapter III. The Small Orchestra

SECTION I

Note. The term "Wood," used alone, denotes the eight instruments in ordinary use—two Flutes, two Oboes, two Clarinets, two Bassoons. The term "Drums" used alone refers to the Kettledrums. For the explanation of the Horn and Trumpet transpositions of the four model scores, see page 126.

Study. *Part II*, Chap. IV, Sec. 8, The Horn.
M.N.D. Nocturne.
Suite, March, No. 2, Wood, Horn and String parts only.

Score. *Mendelssohn*, No. 22, for two Horns and Strings.
Beethoven, Sonata IX, M. 2 for Wood and Four Horns.
Mendelssohn, No. 29, for Wood, two Horns and Strings.
Borch, No. 3, for one Oboe, two Horns and Strings.
Beethoven, Sonata VI, M. 2 for Wood, four Horns and Strings.

Notes. 1. In writing a *Tutti* it is wise to

make the four Horns complete the harmony in themselves, as already done in the case of the Strings and the Wood.

2. It is a good plan to test the correctness of transposed parts by playing them, first from the piano original and then from the score, when the ear should detect any inaccuracy.

SECTION II

STUDY. *Part* II, Chap. IV, Sec. 4. The Cor Anglais.

Suite, Trepak and Danse Arabe; Wood, Horn and String parts only.

SCORE. *Farjeon*, No. 5, for two Flutes, Cor Anglais, two Clarinets, two Bassoons, two Horns, and Strings.

Borch, No. 1, for Wood, Cor Anglais, four Horns and Strings.

Rachmaninoff, Serenade, for Wood, two Horns and Strings.

Mendelssohn, No. 34, for Wood, two Horns, and Strings.

NOTE. In every orchestral piece there are, roughly generalising, three component parts, (1) the tune, (2) a moving accompaniment, and (3) a veiled background of sustained tone.

This third part is not found in piano music, except to some extent by the use of the pedal (again the surest guide to its inclusion) and in scoring it has to be invented: without it a score sounds thin and poor in quality. In hearing an orchestra this unostentatious body of sound, acting as a foil to the moving parts, should be listened for carefully. The best part of each instrument to use for the background is its most neutral part; notes which are very high, very low, or in any way conspicuous should be avoided; the crossing of sustained parts is often a useful plan to follow.

SECTION III

STUDY. *Part II*, Chap. V.; Chap. VI, Secs. 1, 4, 5, Percussion Instruments.
Path. Sym. M. III.
Suite; all Percussion parts.

SCORE. *Farjeon*, No. 2, *Slumber Song*, for Wood, four Horns, Drums and Strings.
Grieg. No. 4, for Wood, two Horns, Drums, Triangle, Cymbals, and Strings.
Beethoven, Sonata, No. 8, (Pathétique); the last twelve bars of the First Movement to be scored as a *crescendo tutti*.

NOTES. 1. Monotony should always be avoided. An idea, say, for accompanying a solo, may be quite good in itself, but if persisted in for a long time, it becomes wearisome to the hearer; no one thing should be done continuously. The best guide to the points where it is wise to to change the style is the phrasing of the original piano music being scored, a new phrase generally needing a new mode of expression.

2. As stated in Part II, the Drum note must always be a part of the harmony, though it need not necessarily be the bass. When it is not the bass, the Bass or Cello should be below it.

3. The easiest way of producing a general *crescendo* is to make each instrument play louder; a more artistic method is by the gradual and regular addition of instruments to the score. The exercise given (from a Beethoven Sonata) should commence with the Strings only, and conclude with the *Tutti* of all the instruments studied up to this point, the Wind and Percussion being added gradually.

Chapter IV : The Full Orchestra

SECTION I,

Study. *Part* II, Chap. IV, Secs. 9 and 10. Trumpet, Trombone, etc.
Part II, Chap. VI, Secs. 2 and 3: Side Drum and Bass Drum.
Suite, Danse des Mirlitons.
Path. Sym. M.I.

Score. *Farjeon.* No. 4, *Night Rustlings*, for Brass only (ten parts).
Mendelssohn, No 27, for Brass, Bass Drum and Side Drum.
Beethoven: *Funeral March* from *Sonata II*, for Wood, Brass, Drums, Side Drum and Bass Drum
Farjeon, No. 7, *At Parting*, for Wood, Brass, and Strings.

SECTION II

Study. *Part II*, Chap. IV, Secs. 2, 6,7. Piccolo, Bass Clarinet, and Double Bassoon.
Path. Sym. M.2.
Suite ; Danse de la Fèe-Dragèe and *Danse Chinoise.*

Score. *Farjeon*; No.3, *Will o' the Wisp*, for Piccolo, Flute, Triangle and Strings.
Borch, No. 4, for Wood, Bass Clarinet, Double Bassoon, four Horns, Drums, Triangle, Cymbals and Strings.
Grieg, No. I, for Full Orchestra.

SECTION III

Study. *Part II*, Chap. VI, Sec. II. The Harp.
Suite. Valse des Fleurs.
Path. Sym. M.4.

Score. *Beethoven.* Sonata III, M.3, for Wood and Harp.
Farjeon, No. 3, *In the Moonlight*, for Full Orchestra, with Cor Anglais, Bass Clarinet, Double Bassoon and Harp.
Grieg, No.2, for Full Orchestra.

The student who has worked steadily through this Part should now be able to select his own material for scores. As a general rule it will be found that music most distinctly "pianistic" is the worst for the purpose: Chopin and Schumann provide little or no material, but nearly everthing that Beethoven wrote can be scored. A list is added of pieces that have been scored by pupils with success, and is given merely as a suggestion. In every case where

there is already a solo part, the accompaniment only should be scored, thus creating a concerto. Pianists would do well to score music which they play ; singers, the accompaniments of their songs. In songs where several verses are alike, the best practice lies in scoring each verse differently

DEBUSSY. *The Children's Corner* Suite.

DVORAK. *Aus dem Böhmer Walde* Bk. 1. (Piano four hands)

KALIWODA. *Nocturnes* for Viola and Piano.

EMIL KREUZ. Song, *A Lake and a Fairy Boat.*

LISZT. Songs, *Die Loreley* and *Es war ein König in Thule.*

MACKENZIE. Part song, *Come, sisters, come* ! (Novello.)

PAUL PUGET. *Song, Chanson de Route,* (from *Chansons pour Elle*).

RACHMANINOFF. Album of Short Pieces.

SCHARWENKA. *Bilder aus dem Süden* (Piano, four hands)

SCHUBERT. Piano Sonatas.

SITT. *Fantasiestück* in F Minor for Viola Op. 53 No. 1.

SVENDSEN. *Romance in* G, for Violin.

WALFORD DAVIES. Part-song, *The Cloud* (Sidney Riorden).

Chapter V. Notes for Advanced Students

SECTION I. *Tutti* Writing

1. There should be economy in *Tutti* writing: the ear soon tires of noise and the good effect of a *Tutti* is in inverse proportion to its length and its frequency.

2. The general rule given that each Group in a *Tutti* should make complete harmony in itself holds good in nearly every case. The Wood being the least powerful Group cannot be heard individually in any large *Tutti* except the high Flute register and the Piccolo. The best plan to follow therefore is to write first the String and the Brass parts and then use the Wood for filling in the gaps.

3. A *Tutti* can be made thick by a multiplicity of parts or thin by a limited number of parts doubled by many instruments. When the total compass is wide thick scoring is a necessity, as wide gaps in the middle always sound badly. In a unison-octave passage the parts should be equally divided between the octaves, when any individual instrument getting out of its compass can leap up or down an octave without disturbing the general effect.

4. The tone-colour of a *Tutti* depends mostly on the register in which the individual instruments are placed. The most brilliance can be obtained by putting them high; a sombre grave tone by putting them low. If quantity of sound merely is desired each should have its easiest and most resonant notes—Strings with open strings, Brass with open notes, and—needless to say—unlimited Percussion.

5. In building up a *crescendo* by additions, the Wood again cannot be considered by themselves, as they are neither strong enough nor subtle enough to influence the scheme. It is wise to begin with the Strings, then to add the Wood and Brass in unisons, in pairs, and to keep back the Percussion for the climax.

6. A good arrangement for the top Wood parts in a brilliant *Tutti* is to use the Piccolo for the top notes, double it in the octave with both Oboes, fill in between with the Flutes, and double the Flutes in the lower octave by the Clarinets.

SECTION II. Harmony

1. Although quite satisfactory orchestration can be done by means of common sense and musical feeling without any knowledge

of Harmony, yet it follows that the most advanced work requires to be founded on a sound harmonic basis. Just as in a picture no amount of skill in colouring will hide bad drawing, so no score sounds clear and satisfying unless the part-writing is good in itself, and the tone well balanced between the parts of each chord.

2. The best guide for the good spacing of chords is the natural harmonic series, which, starting from the octave at the bottom, rises by regularly decreasing intervals. So it follows that the bass instruments should be widely spaced, and the treble instruments closely pressed together. In String divisions therefore it is generally wiser to divide the upper than the lower Strings.

3. The natural and legitimate use of the lowest bass instruments of each Group (Double Bass, Double Bassoon, and Bass Tuba) is to give the lowest octave in the harmonic series, and in a powerful *Tutti* they cannot be better employed. Close harmony of middle parts should not lie below G at the top of the bass stave.

4. Brass harmony, except for the four Horns alone, should always be widely spread. Wood harmony, on the contrary, sounds better

in close formation, especially in the case of the higher instruments.

5. When writing in contrary motion middle gaps should be avoided by the introduction of other parts and instruments; or by the sub-division of parts, if all material is already in use.

6. Sounds of great height and great depth demand harmonic simplicity. All intricate passages belong to the middle of the orchestral compass.

7. Pedal notes can be introduced anywhere if of another *timbre*.

8. The bass of an inversion of a dominant seventh or a minor ninth must never be doubled in an upper part, except in a Harp arpeggio passage, where it is quite allowable.

9. A complicated crossing of parts which looks well on paper often results in incoherence; it can only be distinctly heard when played by instruments with a great difference in *timbre*.

SECTION III. Melody

1. Melody can be made to stand out in four ways; (1) by the addition of force, as when the tune is maked *forte*, and the accompaniment *piano*; (2) by doubling or trebling the tune; (3) by a sharp contrast of *timbre*, as

when a Wind solo is accompanied by Strings ; (4) by the crossing of parts, as when the Cello is put above the Violins, or the Oboe above the Flutes.

3. In music written for the Piano the melody is almost always at the top of the harmony, and next in order of frequency it lies in the bass ; least often is it found in the middle parts. But in the Orchestra the greatest wealth of material lies in the middle, round about Middle C, (which note exists on every instrument except the Piccolo, Kettle-drums, and the very lowest Wind), and, as has been pointed out, many instruments are at their best in the middle of their compass. It follows that orchestral melody most generally lies in the middle of the harmony, and the accompaniment has to be considered accordingly. Melodies which lie otherwise, extremely high or extremely low, are best doubled in the octave, or even in two octaves.

3. It is seldom wise to give a solo passage to two similar Wind instruments. If that mechanical precision which is inevitable when two players have to keep together is the effect required then the added fulness and roundness of tone may be an advantage ; but most Wind solos are of a delicate nature, and such solos should always be confined to one

player of each kind of instrument.

4. When a phrase or passage is repeated it should have more tone the second time than the first, either by the use of stronger instruments, or by the addition of others.

5. For purely dynamic effects the String and Brass instruments are the most responsive; but the finest *diminuendo* and the softest *pianissimo* can be obtained on the Clarinet. With this exception the Wood Wind Group is the least subtle in this particular way, though it furnishes the greatest variety of colour.

6. The effect produced by the re-entry of Instrument or Group depends mostly on the length of its previous silence.

7. Entries and Exits should never be written in a middle tone except in the case of background work. A more definite softness or loudness is required at the beginning and the end of everything.

8. One can never afford at any time to be unrhythmical, least of all at the beginning of any fresh movement: the rhythm then should be slightly exaggerated in order that the hearer can feel the "swing" instantaneously; it should not take him five or six bars to decide in what time the music is written.

9. Grace notes of every kind, being a

Piano effect, are best avoided in Orchestration : if used they should not be doubled. In Wind they are only playable in those conjunctions where shakes and *tremolo* are possible.

SECTION IV. Accompaniment

1. Accompaniments to songs and instrumental solos need special attention. The soloist must have sufficient support, but must never be over-powered. A *Tutti* can only be used when the solo is silent, when it is effective as affording contrast. Wind should be kept in the neutral registers, except for subordinate solo passages. The bulk of the accompaniment should always be given to Strings, even in a Violin Solo.

2. If the solo part is florid, the accompaniment should be simple and the scoring thin. If the solo is smooth with long sustained notes, then the accompaniment should be florid with a full tone, otherwise it lacks interest.

3. In a song the accompaniment should lie for the most part in a different register from the solo ; the man's voice should have a high accompaniment, while the woman's requires a low one.

4. During the solo passages it is unwise to double Wind in the unison, or to have a heavy

sustained Double Bass part: Percussion must also be sparingly used.

5. The doubling of the solo part in the Orchestra is sometimes effective for an isolated passage, but should never be prolonged.

6. Very short snappy chords only sound well when loud; in a soft passage separate chords should be written in fairly long notes. This applies particularly to Strings.

7. While remaining subordinate to the solo, every accompaniment should be made interesting in itself, and acceptable to the players who perform it.

SECTION V. Balance, Combinations, and Tone-Colour

1. Tone-Colour should be varied continually, but without fussiness. For beginners, Professor Prout's rule is a wise one, "Change the colour about every sixteen bars and never in the middle of the phrase."

2. The study of combinations is unlimited and can be taught by no text-book; the knowledge is only obtained by training the ear to recognise the sound of each combination—to know, how, for instance, the Flute and Oboe in unison sound, the Viola and Bassoon in octaves, and so forth.

3. The exact power of the Strings depends obviously on their numerical strength at the moment; but, speaking roughly, it may be said that all the First Violins playing *arco* balance one Wood instrument in *piano*, and two in *forte*.

4. If both Violins are in unison with Viola, the latter adds fulness to the body of tone, but cannot be heard individually.

5. Except in the case of the two Violin parts, it is seldom advisable to put two Strings of the same kind in octaves.

6. Wood blends equally well with Strings or Brass; if used to double Strings, the tone is thickened; if to double Brass, the tone is sweetened.

7. All combinations of Strings and Wood are good, but the Strings generally drown the Wood.

8. Strings and Brass rarely blend well, though a passage for four Horns doubled by Violas and Cellos *divisi* has an extremely good effect.

9. A useful combination is Wind sustained and Strings *pizzicato*, one giving sonority and the other lightness to the whole.

10. One String part in unison with one Wood (for instance, Viola and Bassoon) pro-

duces an effect of solidity, but several String parts in unison with one Wood is a useless arrangement as the Wood tone cannot be distinguished at all.

11. Muted Strings do not blend well with anything.

12. In passages of thirds and sixths it is best to use a pair of the same instrument—two Flutes, two Violins, etc.

13. Percussion blends better with Wind, particularly Brass, than with Strings. Triangle trills go well with high Wood or Violins: Side Drum and Cymbals played with drumsticks blend with Trumpets and Horns: the Bass Drum and Tam-tam blend well with Trombones and the bass Strings.

14. If there is a drum-roll going, it is useless to put any moving figure to the lower Strings, as it would be inaudible.

15. All entirely Brass and all entirely Wood combinations are good on account of the similarity of *timbre*; diatonic writing is best for Brass.

16. A full Brass passage doubled by Wood produces a more mellow and a more *legato* effect than if the Brass were alone, but the Wood is not heard individually. (*Path. Sym.* p. 44).

17. Smaller Brass and Wood combinations require care. If Wood and Horns are in octaves two Flutes, Oboes, or Clarinets are needed to balance one Horn; and three or four to balance two Horns. In the case of Wood and Trumpets three Wood are required to balance one Trumpet when the latter is in the lower octave, but two are sufficient when the Trumpet is in the higher octave. A Trumpet passage that gets too high can be best transferred to Oboes and Clarinets in unison; in this case if the accompaniment to the Trumpet was Wood, it should be transferred to the Horns. It is wiser to avoid combinations of Wood and Trombones. Muted Trumpets blend well with Oboe and Cor Anglais. Stopped Horns blend well with the *chalumeau* of the Clarinet.

18. All Wind instruments, when playing softly, have about the same power, though Trumpets and Trombones should be marked *PP* when the others are marked *P*. But in *forte* and *fortissimo* some adjustment is required to procure good balance. Then Trumpets, Trombones and Tuba have about the same strength; Cornets have rather less; Horns are about half as strong as the larger Brass. It is best, therefore, in loud passages to put two

Horns in unison to balance one Trumpet or one Trombone, and two of any Wood Wind to balance one Horn.

19. When only two Horns are in use a common arrangement is to build four-part harmony with the two Horns and the two Bassoons. They balance perfectly in *piano*, but in *forte* the Horns are apt to drown the Bassoons unless marked *mf* or *mp*. There are two methods of arranging this combination ; (1) by crossing the four parts, giving the consonant intervals to the Horns, and the dissonant intervals to the Bassoons ; and (2) by giving the Horns an octave at the top and bottom of the chord, and putting the Bassoon parts in between ; the reverse of this would be bad. Such a passage is of course best when placed in the neutral registers of both instruments.

20. It is always good to give sustained parts to Brass and moving parts to Wood.

21. A useful method of procuring a glittering top part is to put the Flute and Piccolo in unison (not octaves), the Flute being *forte* and the Piccolo *pianissimo*.

22. A uniform tone of rather a harsh kind can be obtained by writing Clarinets high and Oboes low.

23. Wood Wind writing is simplified con-

siderably by the use of three Flutes and three Clarinets, which, by providing a six-note chord of much the same *timbre,* gets over manifold difficulties. Several of the Russian composers use this arrangement with one Oboe and one Cor Anglais, treating the two latter only as solo instruments.

24. There is no power in the Orchestra, not even in the Brass, that can drown a String unison-octave passage played loudly.

25. Owing to the relative tension of the strings, the tone of the Violin and Cello most nearly approximates, and that of the Viola and Double Bass.

26. There are several ways of avoiding a too-sudden change of tone-colour by a gradual merging of groups. An easy method is to mark one Group *diminuendo* and the other *crescendo* at the same time. A more subtle way is by the use of those parts of individual instruments which relate most nearly to the *timbre* of the other Group. For instance, the harmonics of Strings carry the tone-colour from Strings to high Wood ; the Viola carries String tone to Wood through the middle Bassoon or low Clarinet registers ; low Flute notes can carry Wood tone to Brass through low soft Trumpet notes ; the Bassoon and Horn playing *mezzo-*

forte and in neutral registers can carry Strings to Brass fairly well, while muted Trumpets and stopped Horns can carry Wood to Brass. Wagner's scores are particularly useful for the study of these transitional effects.

A final word to advanced students is that Orchestration is in point of fact a science that has no rules, and that consists entirely of exceptions. For a "special effect" anything is allowable, but too many "special effects" defeat themselves, and produce an inartistic score. Momentary exaggeration is often excellent, but habitual exaggeration spells failure. Young composers anxious to get their work played should remember that "extra" instruments involve extra expense, and that scores containing many parts outside the ordinary Full Orchestra are not so readily accepted for performance for that reason.

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PART II: THE INSTRUMENTS

Chapter I. The String Group

(Note: "String," with a capital S, refers always to the group of instruments: with a small "s" to the catgut itself. Similarly "Bass" with a capital signifies the Double Bass, while with a small initial letter it means the bass of the harmony).

The strings. In all bowed instruments the strings are numbered downwards, the highest in pitch being the "first." The strings are all made of catgut; when described as "covered," the reference is to those which have a tightly-wound metal thread spun round the whole length. These covered strings are the fourth in Violin, and the third and fourth in Viola and Violoncello.

Keys. Theoretically all Strings can play equally well in any key; but those containing their open strings are easier and have more resonance. Keys having a large number of sharps or flats should be avoided; it is better to write enharmonically.

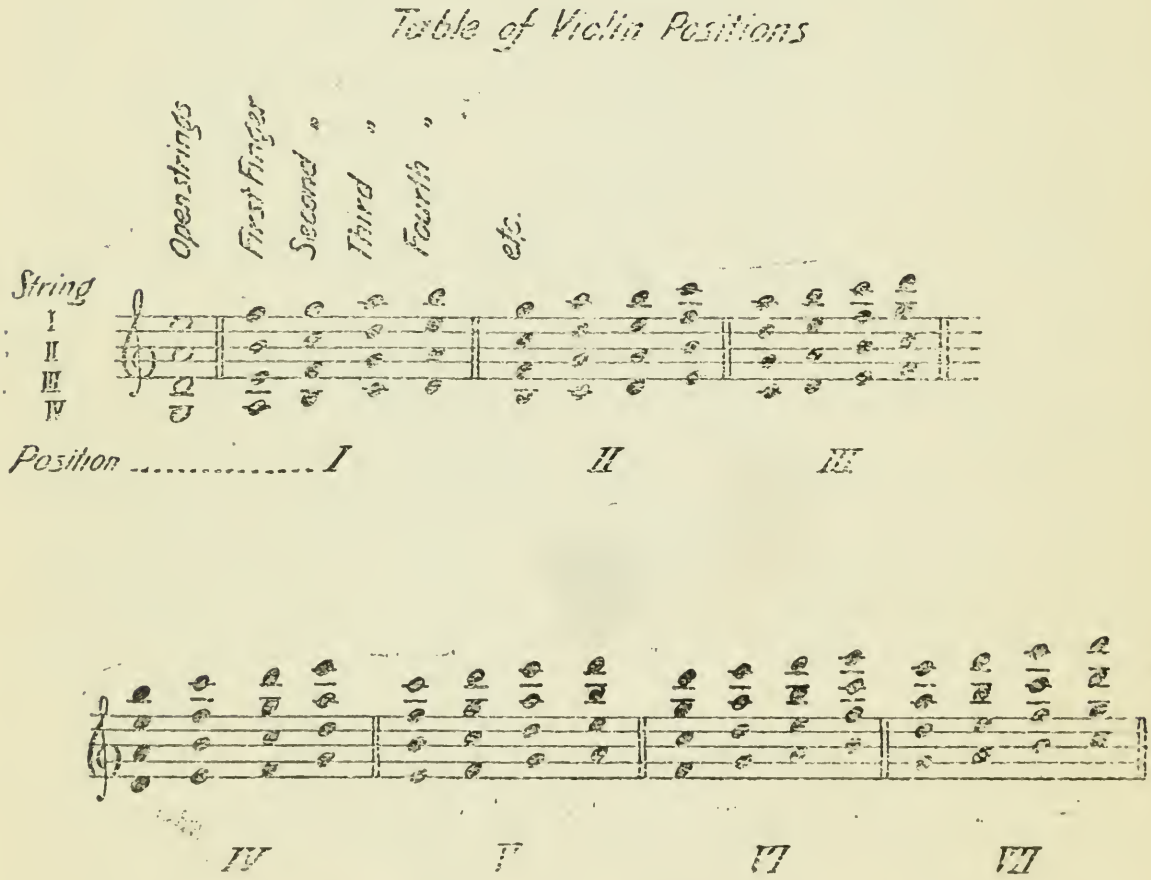
Bowing. The signs ⊓ and ∨ are used to denote "down-bow" and "up-bow" respectively, but it is not necessary to mark them

unless a special effect is wanted. (Path. Sym. M. I.) All the notes to be played in one bow (which must be on the same or on adjacent strings) are slurred. In *piano* a very great number of notes can be taken in one bow on the Violin—in the larger Strings correspondingly fewer—but the tone is weak when the bow moves so slowly ; long *forte* slurs are in consequence impracticable. When no slur is marked the player detaches each note. Various effects of *staccato, portamento,* accents, etc. can be produced if clearly marked.

LEFT-HAND TECHNIQUE. Stringed-instrument playing is mainly a matter of position of the left-hand. The following table shows how in each position the violinist has at his command sixteen stopped notes, and in addition he has the sharp and flat of each of these notes and the four open strings. Good String-writing consists in keeping passages, particularly rapid passages, more or less in one position ; they then " lie under the hand " and are easy and effective. The player is of course shifting from one position to another all the time, but when playing fast it is irritating to have to do this fussily for perhaps only one or two notes. If a passage starts in a very high position the player should be given a few moments before

it in order to get his hand rightly placed. The Table applies equally well to Viola if transposed down a perfect fifth, but it does not apply to Cello or Bass.

5. SHAKES. Shakes of all kinds are possible



on Strings, except the lowest one of all, that on the fourth open string. The notation is ~~~~ and slurs should show how much is to be done in one bow. In a very long shake, however, it is wiser to omit slurs, then each player changes his bow at will and the effect

is continuous. Double shakes should not be used in orchestral writing.

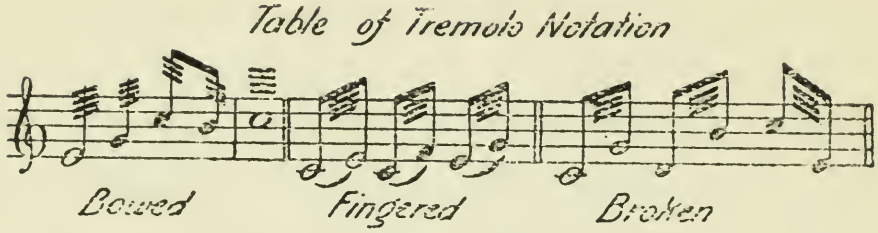
6. Chords and Arpeggios. Chords and Arpeggios of two, three, or four notes are possible which have each note on a separate string and in the same position. Double-note chords on adjacent strings are the only ones that can be played solidly, as the bow can only play on two strings at the same time. Larger chords are "spread," that is, played in groups of two notes, which follow each other with great rapidity. Chords having one or two open strings for their lowest notes are easiest and have the greatest resonance. It is best to confine spread chords to the three upper String parts, and in no case should they be given to Double Bass.

7. Pizzicato. This is done by plucking the string with the finger instead of using the bow, and is an easy and useful device. It is most sonorous on the lower strings and should in no case be written high up in the compass of any instrument, as on a very short string the tone is bad. A little time is needed before and (still more) after a *pizzicato* passage to allow the player to adjust his hand. *Pizzicato* can never be as rapid as bowing; the degree of speed depends on the thickness of the string used, the Violin "first" being the quickest to

respond and the Bass "fourth" the slowest. Spread chords across the strings can be played *pizzicato* under the same left-hand conditions as with the bow. Quick arpeggios to be played with one sweep of the finger across the strings should have a slur; this is the only occasion in which a slur is used in *pizzicato* writing; usually the finger rises for each note. Except on the open strings there is no great range of force possible with *pizzicato*; it is most effective when played *piano*. Left-hand *pizzicato*, a solo device, should not be used in orchestral writing. *Pizzicato* on a natural harmonic (Par. 10 below) is possible and particularly good in Cello, but rather feeble on the other Strings. The direction for *pizzicato* is "*pizz.*" which holds good until contradicted by "*arco*," "with the bow."

8. Mutes. A mute is a small three-pronged piece of metal, wood, or ivory, which is placed on the bridge of the instrument without touching the strings. It deadens the sound somewhat and produces a thin reedy tone. The direction is "*con sordino*," and the contradiction "*senza sordino.*" Time, at least three slow bars, must be allowed in which to put on and take off the mute. Mutes are least often used for the Double Bass.

9. Tremolo. There are three kinds of *tremolo,* (1) *Bowed*; (2) *Fingered*; and (3) *Broken. Bowed tremolo* is the most common, and is very easy and useful. With a quick wrist-action the player reiterates one note (or a double-note chord) as rapidly as possible. It can be played with any degree of force from *PPP* to *forte,* but is most effective when soft. *Fingered tremolo* is a shake of an interval larger than a second; that is—it consists of a very rapid alteration of two notes, using two fingers on the same string; one finger stops the lower note while the other rises and falls as quickly as possible. Open strings should not be used. Intervals so large as to require two strings should be avoided, as this entails a wrist-action which is difficult and can never be rapid. The lower strings are the least good for fingered *tremolo. Broken Tremolo* consists of stopping two notes on adjacent strings and playing them alternately with separate bows as rapidly as possible. It can never be as fast as the other two kinds, but is the best for *ortissimo* work. A very rare effect is a *pizzicato tremolo,* produced by thrumming the notes of a spread-chord across the strings with the soft part of three or four fingers.



10. HARMONICS. (1) *Natural.* Every string vibrates as a whole and in sections simultaneously. By lightly touching it at certain points the whole-length vibration is prevented, and it vibrates only in sections, and thus produces "harmonics." On each string there are several harmonics obtainable; they occur as a regular diminishing progression of intervals upwards from the open string—octave, perfect fifth, perfect fourth, major third, minor third. The lower ones in the series are the easier and the most commonly used. To indicate a harmonic a little "o" is written above the note, which in every case denotes the real sound, not the place where the string is touched.

(2) *Artificial.* Any note on the three highest Strings which is two octaves and a note above its lowest string can be produced as an "artificial" harmonic by stopping the note two octaves below and lightly touching the string with the fourth finger. In this case the real sound produced is not written, but, instead,

the two notes which are stopped and touched: the stopped note is written in the usual way, and the touched note (always of course a perfect fourth higher) has a diamond-shaped head. As the whole hand has to move for each artificial harmonic slurs should be avoided and intervals kept small. These harmonics are easy on the Violin, difficult and risky on Viola, possible and good on Cello, and impossible on Bass. They should not be written higher than two octaves above the lowest one possible.

The harmonic is a special effect and must be treated as such: the sound is thin and fluty, and can never be loud. Harmonics are always unsuitable when the music is fast, and in no case should a single one be introduced in the middle of a quick stopped passage. The bow must be used rapidly, so long slurs are bad, and a passage written entirely in harmonics should as a general rule consist only of the "natural" or only of the "artificial" kind, as an intermixture is difficult. The "natural" harmonics are the easier and have the better tone. A little time for preparation is required for the correct production of all harmonics, as needless to say, unless perfectly in tune, they do not sound at all.

11. Division of Parts. All String parts

can be sub-divided into two, three, or more separate voices. In writing for Strings alone this is often necessary in order to complete the harmony, but at all times it is a useful device by which to obtain variety of tone-colour in the String Group. It is unwise, however, to divide the Double Basses except for a special effect; and as a general rule sub-divisions should be confined to the three upper Strings. It must always be borne in mind that by dividing one String part into two, the tone is thereby diminished by one half, with the result that the tone-balance requires re-adjustment. In delicate passages it is best to divide, even when it is possible for one player to get both notes, as there is inevitably some roughness in double note playing, because the bow is dealing simultaneously with two strings of different thickness. In *forte* work, however, where quantity of tone is required, the part should not be divided if playable without. There is only one satisfactory notation for a division of parts, the direction "div." and for the contradiction "unis." The ambiguous term "à 2" should be avoided. If parts are divided into more than two it is necessary to use extra staves.

12. SPECIAL EFFECTS. (I) *Sul ponticello,*

with the bow kept close to the bridge. It produces an unpleasant hard tone, and is usually confined to bowed *tremolo*. (2) *Sul tasto* (or *sur la touche*), the bow being drawn over the fingerboard; this produces a light, thin tone, only suitable for *PP*. (3) *Col legno*, when the player uses the stick instead of the hair of the bow. It is not drawn, but thrown on the string and allowed to rebound: the result is a succession of hard wooden taps and considerable damage to the varnish of the bow: the effect can never be loud, and to be successful requires a large number of players; it is wiser therefore to give it to all the Strings at once. The contradiction for all three devices is "*naturale.*"

13. Crossing of Parts. This is a useful device with many possibilities, but if the Viola or (more particularly) the Cello, is put above the Violins, it becomes very conspicuous and can only be given a prominent part.

2. NOTATION. It is the only instrument in the Orchestra to use habitually the Alto Clef. When the part gets very high the Treble Clef is used, the part being always written in real notes.

3. BOWING. The bow is shorter, heavier, and less elastic that the Violin bow. It is necessary, therefore, to keep it moving at a good pace in order to get pure tone ; consequently slurs should be shorter than in Violin parts. All the various kinds of bowing are possible.

4. SPECIAL EFFECTS. *Col legno, ponticello, sul tasto, pizzicato*, and the lower natural harmonics are all possible and useful, but it is best to avoid artificial harmonics. Mutes are particularly effective on the Viola, especially on the two outer strings.

5. GENERAL. The tone of the Viola, particularly on the first and fourth strings, is quite unique and cannot be obtained on any other instrument; solos should be kept as much as possible on these two strings. The middle strings combine well with anything, so are useful for filling-in and background work. The Viola blends better than any other String with the wind, even with the brass. Minor keys are better than major; all flat keys better than sharp ; the worst keys for the instrument are E major and B major. A Viola solo is always effective

in a score, but it should be short, and it must never be forgotten that the instrument is naturally unsuited to great rapidity of movement. In modern scores the Violas are frequently divided, sometimes into four or six parts, and this gives the harmony a sombre richness that is not obtainable in any other way.

SECTION III : The Violoncello

1. Compass. The four strings are tuned to C,G,D,A,—an octave below those of the Viola. The upward compass is of course variable, but the highest E in the Treble stave may be suggested as a possible highest note.

2. Notation. All three clefs, bass, tenor and treble are used, and, now, the real sound is always written. In old scores when the treble clef is used, the notes are often written an octave above the real sound ; and because of this ambiguity it is wiser to avoid the treble clef altogether, unless the part gets very high.

3. Bowing. All the various kinds of bowing can be applied to the Cello. Very long slurs are impossible as the bow, heavier and less elastic than the Violin bow, has to be used more rapidly in order to keep the thick strings in vibration.

4. Fingering. The strings of the Cello are nearly double the length of those of the Violin,

2. NOTATION. It is the only instrument in the Orchestra to use habitually the Alto Clef. When the part gets very high the Treble Clef is used, the part being always written in real notes.

3. BOWING. The bow is shorter, heavier, and less elastic that the Violin bow. It is necessary, therefore, to keep it moving at a good pace in order to get pure tone ; consequently slurs should be shorter than in Violin parts. All the various kinds of bowing are possible.

4. SPECIAL EFFECTS. *Col legno*, *ponticello*, *sul tasto*, *pizzicato*, and the lower natural harmonics are all possible and useful, but it is best to avoid artificial harmonics. Mutes are particularly effective on the Viola, especially on the two outer strings.

5. GENERAL. The tone of the Viola, particularly on the first and fourth strings, is quite unique and cannot be obtained on any other instrument; solos should be kept as much as possible on these two strings. The middle strings combine well with anything, so are useful for filling-in and background work. The Viola blends better than any other String with the wind, even with the brass. Minor keys are better than major; all flat keys better than sharp ; the worst keys for the instrument are E major and B major. A Viola solo is always effective

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4. Fingering. The strings of the Cello are nearly double the length of those of the Violin,

consequently the fingering is different. As a rule the player uses consecutive fingers for a semitone and alternate fingers for a tone, so he can only stretch a major third in one position. For high passages (above the B in the treble stave) the thumb is brought round and placed on the strings; these high "thumb positions" are rarely needed in orchestral music, but if used the player must be given a few moments in which to readjust his hand.

5. SHAKES. All shakes are possible, but it is best to avoid those on the thick C string.

6. TREMOLO. Bowed tremolo is easy and effective. Fingered and Broken tremolo must be written with regard to the limitations of the stretch of the left hand.

7. GENERAL. *Pizzicato* is easy and most useful, but should not be too fast. Double stopping is not advisable in orchestral writing, unless very easy; it is far better to divide the part. Octaves, unless the lower note is an open string, are also unadvisable. The fourth is the most awkward interval on the Cello, so any phrase or figure built on fourths should be avoided. Harmonics of both kinds are easy to produce anywhere. Formerly the Cello was only used as the bass of the Strings, but now it can be alloted any task and is equally good

for bass, melody or accompaniment. Melodies lying above middle C are the most effective.

SECTION IV : The Double Bass

1. DESCRIPTION. The Bass has only recently become standardised in England. The instrument now in general use has four strings, tuned in fourths, E,A,D,G, It has a lower compass and a better quality of tone than its larger and noisier predecessor and it is easier to play, but it possesses far less power. Various kinds of Double Basses have existed at different times in different countries, which fact accounts for the various methods of writing for the instrument.

2. NOTATION. The bass clef is used and occasionally the tenor ; in either case the real sound being an octave below the written notes. A rare exception to this rule is in the case of harmonics, which are written in any clef and always at their real pitch.

3. TEMPORARY TUNING. For a special effect it is possible to direct the Basses to tune their lowest (E) string down to E flat or to D, but as this proceeding upsets the temper of both player and instrument it is not to be recommended. If inavoidable it should be employed only for one long note without fingering, and

plenty of time must be allowed for the tuning and re-tuning of the string.

4. FINGERING. At the nut the maximum stretch between the first and fourth fingers is a whole tone; only the first and second fingers can stretch a semitone. The usual method of playing a passage of semitones from one open string to the next is 024240; as the intervals get smaller in the higher positions the first finger is brought into use.

5. BOWING. The bow is very short and the strings are very thick, so in *piano* the bow has to be changed every few seconds, and more frequently as the tone is increased. A long sustained note should be written either with one long slur, (when each player turns his bow at pleasure and so the tone is continuous) or with a succession of short notes *portamento,* so that the bow is changed in accordance with the rhythm.

6. DOUBLE NOTES. A few are possible, one or both being open strings, but their use is inadvisable, and it is better to divide the part.

7. HARMONICS. Artificial harmonics are impossible, but a few natural harmonics are obtainable, and are easy and effective; they are written in real sounds with black dots on the Compass Chart. As stated above the real

sound is always written in the case of harmonics, and the treble clef may be used.

8. PIZZICATO. This is easy and useful, but exhausting to the player if continued for long. It should never be fast, particularly on the lower strings, or the effect is muddled. The lower it is the more resonant is the sound.

9. SHAKES. These are possible but not desirable, as they always sound thick. If used they should be very short and doubled in the Wind.

10. TREMOLO. Bowed tremolo is very often found in scores, but it is never so loud as detached notes, only more exciting and noisy; separate notes as a general rule produce the better result. Fingered Tremolo of an interval not greater than a minor third is practicable (but undesirable) when the lower note is at least a major third above the open string. On the three lower strings it is only good when *piano*, but on the top string it can be *mf* or even *forte*, and come out fairly well. Broken Tremolo is theoretically possible when one of the two notes is an open string, but it is inevitably so slow as hardly to be called a tremolo.

11. SPECIAL EFFECTS. Those mentioned in Chapter 1, 12 can be produced on the Bass and are generally successful. Mutes are occasion-

ally used, but are not recommended; most players object to their use.

12. GENERAL. As a rule it is bad to write fast for the Bass, as it is a slow-speaking instrument and quick movement of any kind is totally unsuited to its nature; the numerous quick passages to be found in old music belong to the orchestral vagueness of the past when the Cello and Bass played from the same part, and each did what he liked and could. Generally the Bass part should be kept up, as the continual growl of the lower strings is ugly and heavy. Very low sounds of any kind demand harmonic simplicity and for the Bass continual moderate movement is the best way of writing. The division of Basses is quite legitimate and now very usual, but in very small orchestra there is often only one Bass player, when obvious difficulties arise; in a thin score it is rarely good to divide the Basses. The best part of the instrument is from the A open string to about a tenth or twelfth above; speaking roughly therefore it is well to confine the Bass part within the limits of the Bass stave. A quick loud passage which continues for a long time is very tiring to the players, and it is a good plan in such a case to divide the Basses, and cut up the passage between them. (*Path. Sym.*, pp. 50, 51).

Chapter III: The Wind Group

1. Wood and Brass. The main division of Wind instruments is between those that are made of wood, called "The Wood," and those that are made of metal, generally brass, called "The Brass." The pitch of each depends on the length of its tube. The differences of tone-colour are due chiefly to (1) the method in which the air is set in motion, (2) whether the tube is conical or cylindrical, and (3) the proportion the size of the tube bears to its length.

The Wood Wind instruments in general use are the Flute and the Piccolo, in which the tone is produced by blowing across a hole in the tube; the Clarinet and Bass Clarinet, which have a single reed; and the Oboe, Cor Anglais, Bassoon and Double Bassoon, which have a double reed. The "reeds" are pieces of rush which are attached to the mouthpiece in such a way that they vibrate with the player's breath, and in their turn set in vibration the air within the tube.

The Brass Wind consists of Cornet, Trumpet, Horn, Trombone and Bass Tuba, all having a cupped mouthpiece, the exact shape of which largely determines the tone. The Brass has the

more power, with great possibilities of *PP*, *crescendo* and *diminuendo*, while the Wood has the greater agility; the relative difficulty being that while the Brass is the more difficult to blow, the Wood is the more difficult to finger. A technical point of difference is that whereas the mechanism of Wood always *raises* pitch, that of Brass always *lowers* pitch.

2. NUMBER OF PLAYERS. The Wind of the modern Full Orchestra consists usually of the following, placed in the correct order on the score;—

Two Flutes,
*One Piccolo,
Two Oboes,
*One Cor Anglais,
Two Clarinets,
*One Bass Clarinet,
Two Bassoons,
*One Double Bassoon,
Four Horns,
*Two Trumpets (or Cornets).
*Two Tenor Trombones,
*One Bass Trombone.
*One Bass Tuba.

Small Orchestras omit those with the asterisk, which are still regarded as "extra" instruments and are often played by the "second" player

of the same family group—the Piccolo by the Second Flute, the Cor Anglais by the Second Oboe, etc. The term "Small Orchestra" means the usual eight Wood Wind, Horns and Strings only. Modern composers often use three, four, or more of one kind of instrument, but students are advised to confine their scores to those given until advanced. Needless to say if one can score properly for two Flutes, it is easy to score for three.

Wind parts are never duplicated as are Strings; so, while there are perhaps six or eight players of the First Violin, there is only one player of the First Flute, and one for the Second Flute, and so on through the Wind Group.

3. Wind Writing. Wind instruments require far more consideration than do Strings. They are less subtle, less agile, and more easily affected by local conditions, such as temperature and "nerves." It must constantly be remembered that the Wind player uses his lips and breath as well as his fingers. Each of the Wind has its own particular weakness, or fad, or limitation, and the various makes of instruments differ slightly in matters of detail. No Wind part may be kept going continuously, as is possible with Strings, or the player becomes breathless and exhausted.

4. Tongueing. In every Wind instrument the sound is produced by a single action of the tongue which sets the air within the tube in motion. Double and Triple Tongueing (the rapid succession of notes in groups of two or three, produced by the tongue moving in such a way as to interrupt the breath) is possible only in those cases where the player has no part of the instrument inside the mouth. On the Flute and Piccolo, which have no mouthpiece, tongueing of all kinds is extremely easy; but all the other Wood instruments, having some sort of mouthpiece within the lips of the player, cannot in consequence do anything beyond single tongueing. In the Brass, where the mouthpiece is outside the lips, Double and Triple Tongueing is theoretically possible for all, but only practicable on the smaller instruments—the Cornet, the Trumpet, and (to a limited extent) the Horn. Although rapid tongueing is easy, it becomes exhausting if continued for a long time, especially on the larger instruments.

5. Compass. The complete compass in Wood, from the lowest Double Bassoon note to the highest squeak of the Piccolo, forms the most extended range of any group in the orchestra. The exact upward compass of any

Wind instrument is indefinable, as it depends considerably on the ability of the player, and on the make of his instrument. The compass given in the chart is intended for ordinary orchestral use. As is the case with the human voice, the very highest and the very lowest notes have the least power of expression, and are the most difficult and the most exhausting to produce. An invariable rule in Wind is that every instrument is at its best and easiest in the middle of its compass, and all solos and prominent passages should be placed there for, whereas Wind instruments are big or small, high or low, the human throat, lips and hands remain the same size. High notes can only be produced loudly. Low notes require most breath. The lower the descent in the compass, the shorter must be the slurs and the greater the number of rests. Low notes on all the deep bass Wind must be used with caution and restraint, as they are slow to speak and very tiring to play. Every note on every instrument that lies below the bottom of the bass stave had best have a breath to itself. These low notes can be held a little if *piano*, but when they are *forte* they must be quite short with many rests before and after. Experienced Brass players can " fake " notes below the actual compass of

the instrument by means of a very loose lip, but it is unwise to score these; they are only good as a makeshift to meet the difficulties arising in old and foreign scores. (Cp., however, Part II, Ch. IV, Sec. 10).

6. KEYS. As a general rule flat keys are the best for Wind. Instruments vary in the degree in which they are affected by key; but in most cases it is best to avoid extreme keys with a large number of flats or sharps, and it is always wise to write enharmonically in order to avoid accidentals.

7. SHAKES AND TREMOLOS. These are generally possible in Wind, but each instrument has its own awkward intervals, and peculiar difficulties in their execution. An exhaustive description of this somewhat unimportant point can be found in every other text-book but this; here information is given only where it can be condensed; in other cases the use of shakes and tremolos is best avoided until the subject is advanced; they are only a trimming and quite unnecessary in the earlier stages of orchestration.

8. PHRASING. Phrasing means breathing, and is as important to the Wind player as to the singer. Each slur must be carefully thought out with regard to the spirit of the music, to the

capacity of the particular instrument in use at the moment, and to the pitch of the notes. A general rule is that the higher the instrument and the higher the notes the more can be done in the same breath.

9. General. As the lips are more easily contracted than distended it follows that ascending intervals are always easier to play than descending intervals ; this applies especially to *legato* slurs and to the double-reed instruments.

Brass instruments have no distinct registers of tone, but generally speaking they become stronger and more piercing as they ascend. The Wood often have several registers of tone, and become more piercing, but not always stronger, as they ascend. With the exception of the Clarinets, the Brass can get the softest *pianissimo*. Skips up and down the compass are very difficult in Brass, but comparatively easy for the Wood instruments.

It must not be thought that the Clarinet is a lower instrument than the Oboe because of their respective positions on the score, which is the result of the Oboe's historic seniority. The Clarinet goes lower, but it also goes much higher.

A very important point to remember in writing for Wind instruments is that they

must be *warm* before they can be played without risk or difficulty. In those cases therefore where the player has had no opportunity to warm his instrument, as in the change of Clarinets (Chap. IV, Sec. V, 3) or when the Second Flute player takes the Piccolo during the course of a piece, or the Second Oboist the Cor Anglais, then unimportant passages for the new instrument should be written for a little while, or the player given time in which to blow silently into his instrument in order to warm it.

(Students are referred also to the Notes following Sec. IV in Part I, Chap. 2).

Chapter IV. The Wind Instruments

SECTION I: The Flute

1. Notation. Treble Clef. Non-transposing.

2. Registers. (1) *Low*; up to "tuning A" the notes are sweet and luscious but easily drowned; when this low register is in use the Double Bass had best be omitted, and the scoring should be thin; long slurs should also be avoided as the player has to breathe after every few notes; these low notes often sound like a Trumpet. (2) *Middle*; the octave upwards from "tuning A" is the sweetest and the best for solos. (3) *High*; everything above the high A becomes more shrill and piercing as it ascends; this register is the most useful in a loud *tutti*.

3. Keys. Comparatively speaking the Flute is little affected by key, but major keys are better suited to it than minor, particularly in the two higher registers.

4. Shakes and Tremolos. All shakes are possible within the two octaves above E (first line of stave). Tremolos should be limited to thirds within the stave.

5. ADVANTAGES. Nimbleness; agility; the Flute can play *legato*, *staccato*, repeated notes as fast as a Violin, most shakes, skips, arpeggios and scales of all sorts with perfect ease and for longer without rest than can any other Wind instrument; its sweet low tone and its brilliant high tone are equally useful.

6. DISADVANTAGES. It has no power of expression of a soulful kind and can only be amiable or merry; it has no power for an effective *sostenuto*, nor for *crescendo* and *diminuendo*.

7. GENERAL. Flute solos lying low are best *piano* and with a thin accompaniment. The two lower registers are good for background work but the highest is too shrill for this purpose. In a loud *tutti* the Flutes should be put high. Flute tone quickly becomes monotonous to hear, so restraint should be exercised with regard to its use. A flute must not be expected to play softly high up in its compass. The oft-quoted "defective" notes need not be considered on the modern instrument.

SECTION II. The Piccolo

1. NOTATION. Treble Clef. The part is written an octave lower than the real sound, in order to save leger lines.

2. DESCRIPTION. The Piccolo is about half the size of the Flute and is about an octave higher in pitch. It has practically the same technique, and consequently the part is often taken by the Second Flute player. The change from one instrument to the other can be made quickly, as there is nothing to adjust ; and as the Piccolo is small enough to be kept warm in the pocket the player can change *to* it more quickly than *from* it.

3. ADVANTAGES. It is invaluable, as Mr. Corder puts it, for providing " the golden braid on tapestry, lending a dazzling glitter to the design." It can give brilliance to a *tutti* climax by trills or flashes, and is useful for strengthening the top part in a thick mass of tone, and for doubling the Flutes in a high passage.

4. DISADVANTAGES. The tone is so penetrating that it quickly becomes monotonous. It is impossible to get soft notes high up in the compass. It is in no way a vocal instrument, and quite unsuited to melody. Shakes cannot be played as high up on the Piccolo as on the Flute. Its low notes are practically useless.

5. GENERAL. The Piccolo must be written for with great restraint or the score becomes vulgarised. It is purely a decorative instru-

ment, to be used on special occasions only. Everything said about the Flute applies theoretically to the Piccolo, but as the latter reaches the top of its compass it is more difficult to play. Long sustained notes are unsuited to its nature and it is at its best in continual rapid movement.

SECTION III : The Oboe

1. NOTATION. Treble Clef. Non-transposing.

2. DESCRIPTION. The Oboe has a very small compass, no variety of tone and is very exhausting to play continuously, as the player requires so little breath that he has to hold it back while playing. For these three reasons it must be written for with restraint. The best part of the instrument is from G on the second line to G on the first space above the stave.

3. SHAKES AND TREMOLOS. All shakes are possible up to the D above the stave. Some tremolos are possible, but there are so many that are awkward or difficult that it is better to avoid them altogether ; in any case they are unsuited to the character of the instrument.

4. ADVANTAGES. The Oboe is particularly good for solos which are short, legato, preferably in the minor, fairly slow, and confined

within the five lines of the treble stave. In a brilliant *tutti* its piercing tone is useful for the higher notes. It is extremely good for sharp *staccato* passages which are not very fast.

5. DISADVANTAGES. It can never be used for long at a time. Its piercing tone cuts through everything and is apt to upset the balance. It does not blend well with other instruments except the Cor Anglais and, in a less degree, the Bassoon. It is good neither for arpeggios, nor accompaniments, nor background. Rapid and florid passages are ineffective.

5. GENERAL. The Oboe is essentially a melodic instrument, and its solos should be accompanied lightly, and preferably by Strings. In a Wood *tutti* its part should lie low and be crossed with others. It has no favourite keys. Any passage having two sharps or two flats together is rather difficult. It is less affected by temperature than any other instrument, and for this reason is the one selected to give the A to the Orchestra for tuning.

SECTION IV : The Cor Anglais

1. NOTATION. Treble Clef. The part is written in the key a perfect fifth higher than the key of the piece.

2. DESCRIPTION. The Cor Anglais is an

Alto Oboe, having the same fingering and practically the same technique as the ordinary Oboe. It is rather easier to blow and rather more difficult to finger ; its tone has no brilliance and is less piercing than that of the Oboe. Everything written in the preceeding Section applies also to the Cor Anglais.

3. GENERAL. If not overdone the Cor Anglais is perhaps the most beautiful instrument for solo work, especially for solos of a mournful character. Its top octave is bad, and it is not worth while to write above the treble stave, as the Oboe can get the notes better. If the Cor Anglais part is to be played by the Second Oboe player (a very usual arrangement) he must have time to change and warm his instrument.

SECTION V : The Clarinet

1. NOTATION. Treble Clef. Transposition, a major second or a minor third higher than the real sound.

2. DESCRIPTION. Every Clarinet player has two instruments, one built in the key of B flat, and a larger one built in the key of A. This is solely to avoid extreme keys, which involve complicated fingering and are therefore particularly difficult for the Clarinet. The B

flat instrument has its part written a major second higher than the real sound; the A instrument has its part written a minor third higher than the real sound; in each case the key-signature is given, so in a full score the Clarinets' key-signature is always different from the others. There is practically no difference in tone between the two Clarinets, and the technique is exactly the same; the A, being rather longer, has of course a bigger stretch for the fingers, and for small hands is a little more tiring to play.

3. Choice and Change of Instrument. That Clarinet should be selected which in its transposed key, has the smallest number of flats or sharps. For instance, if the piece is in E Major, the A Clarinet should be chosen, because in its transposed key (G Major) the part has only one sharp, whereas if the B flat instrument were chosen the part would have six sharps, being in the key of F sharp major, the major second higher than the original. A player can change his Clarinet in the middle of a piece, if ample time is given him to do so, but changes should not be made unnecessarily. The same mouthpiece is used for both instruments, so this has to be removed and re-adjusted for each change.

4. Registers. There are four distinct registers and consequent varieties of tone, though a good player can so merge one into another that the difference is hardly apparent to the ear. (1) *Chalumeau*, from the bottom of the compass to E, first line of stave; (2) a weak section from F to B flat; (3) B natural to the B above; this octave is the best part of the instrument; and (4) all notes above this high B, which are shrill and piercing. No. 1 is useful for special effects, particularly when there is no Bass Clarinet, but it is very easily drowned. No. 2 is useful for background work, but should be avoided in a prominent passage, as it is of bad tone quality and technically difficult. No. 3 should be used for solos. No. 4 is ugly and difficult, but is useful sometimes in *Tutti* writing.

5. The Break. This awkward mechanical weakness, peculiar to the Clarinet, is not such a terrible thing on the modern instrument as it formally was, but it should not be forgotten. It lies just round B flat, in the middle of the treble stave, and no prominent nor rapid passage should lie across it.

6. Shakes and Tremolos. On the modern instrument all shakes are possible, but there are a few which are clumsy and difficult. These

are, roughly, major seconds on any F sharp or C sharp, minor seconds on the lowest F natural and G sharp, and shakes close to the break. It is the best Wind instrument for tremolo work ; all tremolos up to an octave are possible, provided they do not cross the break, nor rise above the C above the treble stave. Any containing a C sharp should be avoided and the best intervals are a third, a fourth and a fifth.

7. ADVANTAGES. The various tone qualities. The Clarinet ranks next to the Flute and Piccolo in mobility, can play arpeggios extremely well, and repeated notes with single tongueing as fast as the Flute ; it is good for scales, shakes, tremolo, background, and can take skips easily : it has the most complete control of any Wind instrument over *crescendo* and *diminuendo*, and its *pianissimo* is the softest that can be obtained in Wind.

8. DISADVANTAGES. The break and the weak middle register : it cannot play in advanced keys : owing to its being built on a twelfth, instead of the usual octave, any series of octaves or passages formed on an octave are not good.

9. GENERAL. The Clarinet, in spite of its disadvantages, is the most useful Wind instrument of all, on account of its variety of accom-

plishments ; practically it can be asked to do anything. Before making the choice of Clarinet the whole piece should be examined, as the key which is the best at the beginning does not always remain so : it is better to write enharmonically than to use many sharps or flats. When the player has to change in the course of a piece he should not be given an important passage on the new instrument until he has had time to get it warm and in tune. In German scores the B flat instrument is described as " in B " because the English B flat is the German B, and the English B is the German H.

SECTION VI : The Bass Clarinet

1. DESCRIPTION. This instrument is an enlarged edition of the ordinary Clarinet, an octave lower in pitch ; its compass, however, is smaller by a minor third. Only the B flat instrument remains now in use.

2. NOTATION. There are unfortunately two methods of writing the part, French and German. The French Method is to write always in the Treble Clef, a major ninth above the real sound —that is, the usual major second transposition of the B flat Clarinet, plus the octave lower : this is the easier for the player as the fingering is the same for both instruments. The German

method is to write in either Bass or Treble Clef according to the pitch of the notes, a major second above the real sound—that is, the usual transposition of the B flat Clarinet, minus the octave lower. This is more difficult for the player, as it has a different fingering and Clarinet players are not used to the Bass Clef. Keeping in mind the general rule to make things easy for the player it is obvious that the French method is better, but until the vexed question is settled, it is wise to direct at the beginning of the score " to sound a major ninth lower."

3. ADVANTAGES. It has the greatest power of *pianissimo* of any Wind of its pitch (for this reason it always plays, when present, the four-note Bassoon solo near the beginning of the *Path. Sym.*) and a great range of *crescendo* and *diminuendo*. It has been called the " Bass Goblin of the Orchestra," and this exactly describes its unique tone, which is perfect for a slow, mournful, *legato* solo. It blends well with the rest of the Wood, to which it makes a good bass, and it can be used too as the bass of three-part Clarinet harmony.

4. DISADVANTAGES. It cannot convey the idea of joy or gaiety, has little power of attack, and no rhythmical qualification. Rapid passages can be played but are ineffective. It

cannot be worked so hard as the ordinary Clarinet.

5. GENERAL. Everything written about the Clarinet applies theoretically to the Bass Clarinet, but being lower in pitch, it is naturally more exhausting to blow, while its size and the great length of the tracker-rods make it more awkward to finger. Moreover it possesses very strongly marked characteristics of its own. The top fifth is poor in tone and passages in that position are best allotted to the smaller Clarinet; if given to the Bass instrument the part should be doubled.

SECTION VII: The Bassoon and Double Bassoon

1. NOTATION. The bass clef is used principally; for the higher notes the tenor or treble, preferably the tenor, for the same reason as in the case of the Cello. (See Chap II, Sec. III, 2) Non-transposing.

2. REGISTERS. All the minute particulars given in the text-books of former times with regard to the registers, their weaknesses and difficulties, apply to the older types of instrument. In the modern Bassoon, with its highly developed mechanism, they have almost ceased to exist. The lowest notes, as

always with Wind, are rather rough, though the lowest B flat is a good note. All the middle part is good, but when the treble stave is reached the tone begins to get thin and poor.

3. ADVANTAGES. It is one of the most useful of the Wind on account of its adaptability. It has a large compass and can do solos, accompaniment or background work with equal ease. Scales of all kinds and repeated notes are easy. It can take wide unslurred skips with great rapidity, has an excellent *legato*, a very good *staccato* and blends well with most instruments, particularly the Horn.

4. DISADVANTAGES. Its fatal aptitude for sounding comic in the very things it can do best. It has a somewhat limited range of dynamics, and cannot play so softly as the Flute or Clarinet nor so loudly as any other Wind of its pitch. Arpeggios, shakes and tremolos are not suited to it and are best avoided. It is the most imperfect of all the Wind instruments, so the composer is considerably at the mercy of the performer's ability to overcome the various defects of his instrument.

5. GENERAL. A Bassoon solo should be thinly accompanied; the player should never be obliged to force his tone, or it becomes harsh

at once. Passages lying above middle C should be doubled by some other instrument, and the Viola is good for this. The combination of F sharp, G sharp (G flat, and A flat) in any octave is difficult and cannot be played *legato*. Very long sustained notes low down in the compass must be avoided.

6. THE DOUBLE BASSOON. The larger instrument is in nearly every respect similar to the smaller, to which it bears the same relation as Double Bass bears to the Cello. It is an octave lower in pitch and correspondingly unwieldy and difficult to blow and handle, so it must be written for with restraint and many rests. Everything written about the Bassoon applies technically to the Double Bassoon. The lowest octave is its best.

SECTION VIII: The Horn.

(Note) This section refers to the Horn in F only, as modern players confine themselves to the F crook. For information regarding the other crooks see the Chapter "On the Study of Old and Foreign Scores."

1. NOTATION. Treble Clef only. The part is written in the key of C, a perfect fifth higher than the real sound, the necessary sharps and flats being added as required : it is best to write enharmonically if by doing so accidentals are

avoided ; when the choice is open flats should be used in preference to sharps.

2. Stopped and Open Notes. The Horn is the only instrument which enables the player to regulate the pitch by the insertion of the hand in the bell. It is this combination of hand and lip which gives the Horn its great range of tone-colour and its variety of expression. But it is advisable to leave the matter entirely to the player, there being no need now to fuss him about open and closed notes, *except* in two particular cases ; (1) when the hard brassy overblown stopped sound is wanted an x should be put over the note ; and (2) when the soft muffled stopped note is wanted, direct "*con sordino.*" The Score should be thin when either of these effects is in use.

3. Double and Triple Tongueing. This is possible in the middle register, between the (written) G below the treble stave and the C in the stave, so reiterated notes within these limits are practicable and effective, but cannot be fast.

4. Shakes. These are done with the lip only and are extremely difficult and risky. Those possible are major seconds between G (second line) and the G above—both written notes.

5. Horns in Four-part Harmony. This is a common device, which is most useful and

effective when not overdone. Close harmony is best, in the middle of the compass. The Fourth Horn must not be put too low, unless it has an extra allowance of rest, as it is exhausting to play low notes continually ; it is good sometimes to help out the passage with Trombone. The low parts should not have long slurs ; the middle parts can be crossed sometimes with advantage ; and the Bassoons can help out when more than four notes are required.

6. ADVANTAGES. The Horn is the most beautiful instrument in the modern orchestra, and one of the most useful. It can blend at will with any combination, is perfect for slow melody, background work and accompaniment.

7. DISADVANTAGES. The Horn lacks mobility, and cannot play fast : it does not like extreme keys : the part must not be over written, in spite of the ever-present temptation. Skips are bad and scales and arpeggios do not suit it well.

8. GENERAL. It is still wise to write the four Horn parts in pairs, as has always been done ; in a passage of double thirds, for instance, each pair should be put in octaves. A modern player can play high or low notes equally well, but he must have time to re-adjust his lip. If the Horn is taken up above the stave, it should be

by steps of a second (*Eroica*, p. 140). In using one Horn with Wood its best place is at the top or the bottom if it is to blend well. The middle register resembles and blends well with the Bassoon, so it serves as a transitional instrument between Wood and Brass. A good working rule is to keep written Horn parts between Middle C and the top of the stave,. The Horn is the instrument most capable of making itself heard in the middle of a mass of tone. (*M. N. D. Nocturne*).

SECTION IX: The Trumpet and the Cornet

1. Introduction. For many years players had to struggle with the " natural " Trumpet, that produced only open notes. Then the valve Trumpet was invented, and gradually improved by various makers until the fine Trumpet in F evolved. This is a noble, dignified instrument, with a magnificent tone, and almost as much colour variety as the Horn ; but unfortunately it is extremely difficult to play. As time goes on music becomes more complex, and as a result, there is a tendency to manufacture instruments easier to play, the ease being obtained by a sacrifice of tone. So we find the beautiful F Trumpet steadily dying out of use, its place being taken by a small B flat instrument, which is really a com-

promise between the Cornet and the Trumpet. It has the same compass as the Cornet and is almost as easy to play.

2. NOTATION. Treble Clef only. As a result of the various changes in the instrument Trumpet writing is not yet standardised, and players are so experienced in transposing that they are quite indifferent to it. There are three courses open—(1) to write for the F Trumpet, a perfect fourth lower than the real sound, which has the advantage of putting the Trumpets in the same key as the Horns : (2) to write as if for Clarinets (the B flat Trumpet is always provided with an A shank), which has the advantage of being the method used for the Cornet, thus making the part interchangable : (3) to write the part in C, that is, in real notes, which has the advantage of having no transposition at all.

3. SHAKES. These are done with the pistons so depend on the fingers as well as on the lip ; a few can be obtained in the middle of the compass, but they are risky, can never be very fast, and are on the whole undesirable.

4. MUTE. This is a pear-shaped stopper inserted in the bell, by which two distinct effects can be obtained ; (1) *piano,* which reduces the sound to a faint echo ; and (2)

forte, which by overblowing produces a weird pungent tone: the *P* or *F* must be carefully marked in every case. Muted notes can only be placed within the stave, and the player must have time to put in and take out the mute. The direction is "*con sordino*" and the contradiction "*senza sordino.*"

5. ADVANTAGES. The Trumpet is unequalled for brilliance, and very beautiful soft effects can be got in the middle and lower parts of its compass. Given time for rest and breath, the Trumpet can be as agile as the Flute, but rapid passages are much more exhausting for the player than is the case with the Wood instrument.

6. DISADVANTAGES. The tone of the Trumpet soon becomes tiring to hear, especially if the part lies high; and the player's power of endurance is more limited than in the case of any other instrument of its pitch.

7. GENERAL. A good rough rule is to keep the Trumpet part between Middle C and the top of the treble stave (as in Oboe) unless for a special and momentary effect. All kinds of tongueing are possible, but as a good deal of breath is needed for Trumpet playing it is wise to break up a series of reiterated notes into groups, or to divide them between the two

players. No soft notes are possible above the treble stave. The lower half of the compass blends well with the rest of the Wind, but as the compass ascends, the tone becomes more and more conspicuous. Below Middle C no long slurs are possible, and no rapidity.

8. THE CORNET. In the days of the Trumpet in F it would have been necessary to write a separate section on the Cornet; but the B flat Trumpet and the Cornet are so nearly alike in compass, tone, execution, and general character that this is now needless; the part is entirely interchangable. If Cornets are specially written for, the parts must be transposed for either the B flat or the A instrument, in exactly the same way as for the Clarinet.

SECTION X: The Trombones and Tuba.

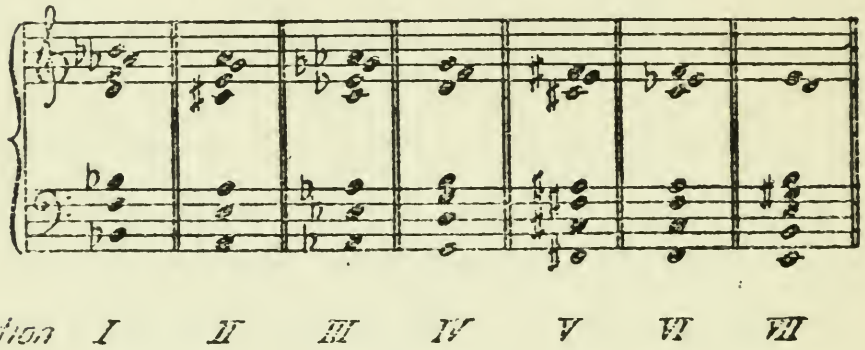
1. DESCRIPTION. In England at the present time two kinds of Slide Trombone are in use, the Tenor and the Bass, two of the former and one of the latter being found in every complete orchestra. The Tuba now in use is a valve-and-piston instrument, built in F, which can sound its fundamental note. In other countries various kinds of Trombones and Tubas have been and are in use, some of which have a lower compass than the English instruments.

2. Notation. Both Trombone and Tuba are non-transposing instruments, in spite of their being built in keys other than C. The real sound is always written and the proper key-signature used. The four parts are written, on two staves, bass clef being used for the lower, and either tenor or bass for the upper.

3. Low Notes. The directions given respecting low notes in the fifth paragraph of Chapter III apply particularly to the Trombones and Tuba. Below the ordinary compass of the Tenor Trombone are three deep pedal notes,— B flat, A natural, and A flat,— marked with diamond heads on the Compass Chart. Of these the B flat is the best, but all are rather risky, and if used should be approached from the octave above, or follow rests. The corresponding notes on the Bass Trombone are impracticable.

4. Trombone Positions. The Trombone, like the Violin, possesses a technique of Positions, and good writing consists in placing notes either in the same or in neighbouring positions. Great skips to distant positions are impossible without rests to give time in which to adjust the slide. The following Table gives the positions of the Tenor Trombone, and can be applied to the Bass Trombone if transposed down a minor third.

Table of Trombone Positions
(Tenor Trombone)



5. SHAKES. Shakes, done with the lip only, are almost impossible on the Trombone. Slow shakes can be done on the Tuba with the pistons and certain of these, played with one piston only, and lying within the bass stave are practicable and good in effect. But shakes are so entirely unsuited to the nature of these low Brass instruments, that the student would be wise to avoid them altogether.

6. ADVANTAGES. As the making of notes on the Trombone is completely under the player's control (as is the case also with the Strings and the Kettledrums) perfect intonation is possible. The Trombone can play with any degree of force, with very great beauty of tone, equally well in any key, and it can hold the same note for a very long time. Soft four-part harmony for the three Trombones and the Tuba (or one Horn) is a useful and a most

beautiful effect; but for this, each instrument must be kept in the middle of its compass.

7. Disadvantages. These heavy Brass instruments can play neither fast nor for long at a time. As the slide of the Trombone has to be adjusted for each note it follows that no perfect *legato* is possible, except sometimes in the case of harmonics rising from the same fundamental; phrasing therefore of any kind is impossible.

8. General. Solo writing is unsuited to the nature of these deep pitched Brass; they are at their best when used together in well spread harmony. Octaves and two-part writing are risky, as the slightest difference in intonation in such low instruments sets up very violent "beats." It is as necessary for the Trombone player, as for the Horn player, to hear mentally his note before he sounds it, so parts should be written vocally. Unless noise merely is wanted a lower dynamic should be given to the Tuba, *e.g. forte* when the rest is *fortissimo*. Tuba tone never completely blends with the rest of the Brass, so in delicate work it is wiser to use the Bass Trombone for the bass of the harmony, and to introduce the Fourth Horn in the middle. If it is desired to modify the brilliance of the Brass the parts

should be doubled in Wood. The military valve-trombone, a necessity for cavalry regimental bands, is occasionally used in the Orchestra, the scoring being the same as for the slide instrument. Trombones are very rarely muted.

Chapter V: The Percussion Group

1. The Percussion instruments are the least important, the most conspicuous, the most rhythmical, the easiest to write for and the easiest to play. Their good effect is in exact inverse proportion to the frequency of their use. Nothing vulgarises a score so readily, nor palls on the ear so soon, as the sound of overmuch percussion: nothing is more effective than its judicious use. Restraint, therefore, is the Alpha and Omega of good writing for this Group.

2. Percussion instruments are continually on the increase, as modern composers extend their demands for novel effects. The ones included here are those in ordinary use, the writing for which demands some technical knowledge. No particular information is required in order to write for an anvil or a bird-whistle.

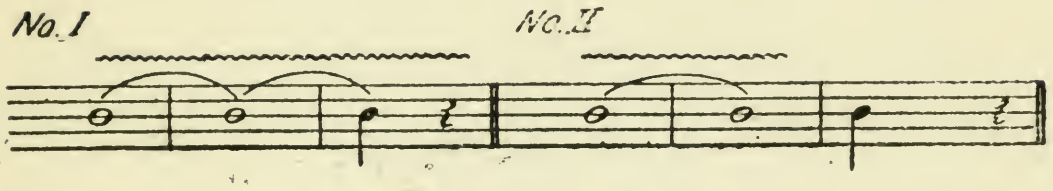
3. Most Percussion instruments are of indeterminate pitch. Of these it may be said in a general way, that the Triangle is treble, the Side-drum and the Tambourine alto, the Cymbals tenor, and the Bass-drum and Tam-tam bass.

4. The Kettledrums, Glockenspiel, Xylophone and Celeste, having definite notes, must have staves; but for the rest of the Group it is far better to write each part on a separate and single line, even if this entails the sticking of pieces of plain white paper over one or two staves of the score. If staves are used it is usual to allot one to two instruments, when great care must be exercised with regard to tails and rests.

5. All Percussion instruments vibrate for a considerable time after being struck unless damped, and the bigger and deeper the instrument the longer it vibrates. Consequently the exact length of notes and rests must be a matter of meticulous accuracy.

6. On account of the conspicuous character of the Percussion, dynamic marks must be inserted with greater attention to detail than is necessary in the case of Strings and Wind. For instance, every *crescendo* must state what it starts from and what it goes to. In the case of a long *crescendo* the intervening steps at which it arrives should be shown thus: —*pp*, *cres.*, *p*, *cres.*, *f*, *cres.*, *ff*.

7. Rolls and trills must be written in one of the two following ways :—



No. 1 signifies that the roll continues till the first beat of the third bar and then stops No. 2 signifies that it continues to the bar-line and is then concluded with a separate stroke. Without slurs the player makes an accent at the beginning of each bar. Rolls on any instrument are very fatiguing to the player and should not be too long on that account.

Chapter VI. The Percussion Instruments and the Harp

SECTION I: The Kettledrums

1. Description. A Kettledrum is a basin shaped metal shell with a head of skin stretched over the top, the tightness of which is regulated by screws all round the shell. The tightness of the skin determines within a perfect fifth the pitch of the Drum. It is played upon with two sticks having padded ends, the only two effects being separate notes and the "roll," produced by a rapid wrist action of the two sticks at the edge of the Drum. Most modern orchestras have three Drums,—Big, Middle, and Small. A Kettledrum can be manufactured in any size in reason, but the three in general use have the compass given in the Chart.

2. Tuning. The exact note to which each Drum is to be tuned should be written clearly at the beginning of the score on a small stave. Drums can be tuned during the course of the music, but this should be done neither unnecessarily nor frequently. The direction for retuning is "Tune C to D," or "Change C to

D," or (in Italian) " Muta C in D." The two important points to remember in regard to Drum tunings are (1) that the interval of change must be as small as possible, or there is the risk of splitting the skin, which is not a piece of elastic ; and (2) to allow the player ample time in which to screw all the keys round the Drum-head ; a rough-and-ready rule is " Allow three bars of *Moderato* 4-4 time for every interval of a second " ; but of course the longer the time allowed, the easier is it for the player, and the healthier for the instrument.

3. NOTATION. The part is written in the bass clef, with key-signature and real notes.

4. SPECIAL EFFECTS. (1) Muffling (*coperti*), done by placing a handkerchief or something of that sort on the head ; (2) using the Side-drum sticks or (in a roll) the player's knuckles, instead of the proper sticks : (3) placing three heavy articles (such as the tuning-keys) on the head, which produces an effect similar to that of the Side-drum, the obstruction acting like the snares of the latter.

5. GENERAL. The Kettledrums have an immense range of expression from the softest *pianissimo* to a gigantic *fortissimo*, and all gradations of tone are completely under the control of the player. If the tunings can be

confined to two Drums it is an advantage in the case of small bands, which often only possess two instruments. As the Middle Drum is of varying size it is best to avoid the top and bottom notes, G and E. It is possible to strike two Drums simultaneously, and thus get a two-note chord, but the effect is not good. With extra drummers and extra instruments the possibilities of Kettledrum writing are almost unlimited. As the Drum has a definite pitch, its note must always be a constituent part of the harmony, but it need not necessarily be the bass. Formerly the two Drums were invariably tuned to the tonic and dominant, and in simple scoring this is still an excellent plan. When a roll is wanted below the pitch of the lowest F it can be done with the Kettledrum sticks on the Bass Drum, or a similar effect produced by a tremolo on the Double Bass. It by no means follows that a part easy to read is therefore easy to play. All Drum writing is easy to read, and the best way to test its actual difficulty is to play it through with two sticks on three cane-seated chairs; if the part is clumsy the hands get badly "locked." The best Drum writing is that which is simple and soft, and the lowest notes are always the best in tone. For additional

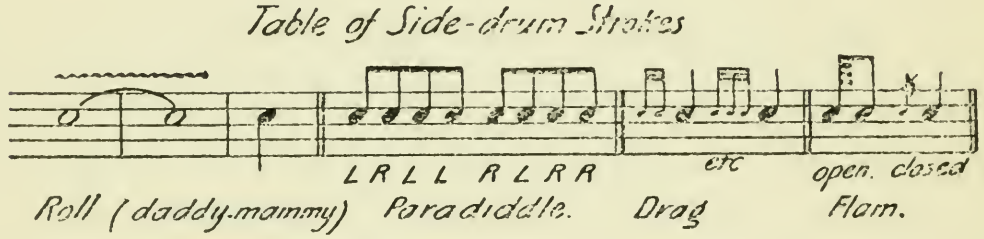
information about the Kettledrums see Mr. Gordon Cleather's Lectures. (Bibliography, page 135).

SECTION II: The Side Drum (Tambour Militaire)

1. Description. The Side Drum is a small brass cylinder, with two parchment heads played with two hard wooden sticks. Its peculiar tone is due to the "snares," pieces of catgut which are stretched across, and resting upon, the lower head.

2. Strokes. (1) *The Roll* (or "daddy-mammy"); in the case of the Side-drum (alone among the Percussion) it is wise to finish a roll with a separate stroke, or to conclude it a beat or two before the rest of the orchestra. If a roll is broken into detached phrases the the player must have time to re-start between each. (2) *The Paradiddle*: a method of stroke which ensures that the whole-bar accent and the half-bar accent shall fall to the left and the right hand respectively, the strong accent being done by the left-hand. This is included for the sake of completeness only; no direction is necessary. (3) *The Drag*: this consists of a group of 3, 4, 5, or 6 notes played as a roll, and concluding on an accented note;

the groups with uneven numbers are the best. (4) *The Flam* ; two notes, one with each hand, played quickly : if the first note is on the beat it is an Open Flam : if the second is on the beat it is a Closed Flam.



3. Special Effects. Muffling, to prevent the "crackling" sound, can be done in two ways ; either by loosening the snares, or by pushing the cords (or something soft) between the snares and the drum-head to prevent contact. A good imitation of castenets can be obtained by playing on the wooden edge of the Drum.

4. General. The utility of the Side Drum is either military or rhythmical, and it is useful also for adding to the tone in a great climax ; its chief effect lies in its entry, after which the sooner it stops the better. Single detached notes are bad ; the Drag and the Flam are the correct strokes for isolated accents. A roll should never be so long as on the Kettledrums.

SECTION III: The Bass Drum

This large drum has the deepest note in the orchestra; it cannot be tuned; only two methods of playing it are possible; (1) Single strokes at a considerable distance from each other; and (2) a roll, done preferably with the Kettledrum sticks. The two legitimate effects are to add to the force of a climax or to convey the idea of awe in a *pianissimo*. If a *very* short note is required it is best to add the direction "damp," as the Drum vibrates a very long time after being struck. It is muffled either by being wrapped in a cloth, or by loosening the braces, or both.

SECTION IV: The Triangle

The Triangle is a small bar of steel made in the shape of a triangle, and struck with a steel beater. The only effects possible are single notes, trills, and groups of notes similar to the Drag and Flam of the Side Drum. These small groups should consist of an uneven number of notes, to allow the player to begin and end with the downward action of his beater. The best effect of all is that of single notes at rare intervals and not too loud.

SECTION V.: The Cymbals

Two large circular brass plates of equal size, (the larger the better for tone), which are played in four ways; (1) by clashing them together brushwise; (2) by striking one either with a Side Drum stick or a Kettledrum stick; (3) the "two-plate roll," produced by agitating the edges against each other; and (4) by hanging one by the strap and playing a roll on it (one stick on each side) with the Kettledrum sticks or with the knuckles. If notes appear in the part without instructions the player uses No 1, which is the only one possible for a loud effect; exact directions must be given for Nos. 2 and 4, and Nos. 3 and 4 require the usual symbol for a roll. The three last methods of stroke are only applicable to middle tone or soft passages.

SECTION VI: The Gong, or Tam-tam

This huge instrument can only be used for single blows with the Bass Drum stick, and is most effective when soft. It is dangerous to attempt more than this on the Tam-tam because of the difficulty of stopping the vibrations afterwards; otherwise a dinner-gong roll would be possible.

SECTION VII : The Tambourine

This ancient and familiar instrument can be played in four ways ; (1) by knocking the parchment with the knuckles ; (2) by violent shaking so that the " jingles " rattle ; (3) by rubbing the thumb on the parchment so as to produce a tremolo effect ; and (4) by placing the ball of the hand in the middle of the head and striking the parchment lightly at the edge with the four fingers. The first two methods, only possible in *forte* and *fortissimo* passages, are as old as the Tambourine itself ; the last two are modern devices invented to meet the requirements of soft passages. If notes are written without instructions No. 1 is used No. 2 has the usual sign for a roll ; for No. 3 write " *trem.*" ; and No. 4 " *col mano.*"

SECTION VIII : The Glockenspiel

This instrument has several forms. One commonly used in England consists of a series of steel plates lying horizontally on a framework. As the exact number of plates varies in different makes, it is wise to confine the part to that one having the smallest compass, twenty-seven notes, the one given in the Compass Chart. Another kind, having a far better tone,

consists of eight small gongs, bells, or steel bars hung on a lyre-shaped frame. Both kinds are played with two wooden hammers. A third kind, having a keyboard, has almost fallen out of use, while the military instrument, thirteen plates on a lyre-shaped frame, is rarely used in the concert-room. Simple Glockenspiel parts are sometimes played on a set of Tubular Bells.

The Glockenspiel should never be given rapid passages, as it is a slow-speaking instrument and the effect becomes blurred. Its best use is as a gilt-edge to high Wood Wind, somewhat after the manner of the Piccolo, but without the Piccolo's velocity. It has no sustaining power, so it is useless to write notes longer than a crotchet, or to introduce slurs ; nor has it any range of dynamic force beyond a uniform middle tone. The part is written on one stave, treble clef, two octaves below the real sound. It is best to confine the part to single notes : Two-note chords, though possible, are unsatisfactory.

SECTION IX : The Celeste

The Celeste most used in England consists also of steel bars struck with hammers, but it is played from a keyboard, similar to that of a Piano, shortened. It possesses a system of

resonators and a pedal mechanism, which increase its sustaining power. The part is written on two staves, like a Piano part, but an octave below the real sound. It is as easy to play as the Piano, and should be treated in a manner which comes between that of the Piano and that of the Glockenspiel. Melody notes should not be long. Its chief use, like the Glockenspiel, is to pick out the high lights of a dainty Wood passage. The Celeste part of the *Casse Noisette* Suite is a perfect example, but the notes here are written at their real pitch.

SECTION X : The Xylophone

This instrument is similar to the twenty-seven barred Glockenspiel except that the bars are made of wood instead of steel. It is played with wooden hammers. The part is written on one stave, with the treble clef and in real sounds. The best part of the instrument is the octave above the C in the treble stave.

SECTION XI : The Harp

1. DESCRIPTION. Each one of the forty-seven strings of the Harp is a flat note, and the seven-pedal mechanism causes each string to be raised in pitch either a semitone or a tone ;

that is, each string can be raised from the flat to the natural, and again from the natural to the sharp, all the strings of the same name being affected by the pedal simultaneously. Double sharps and double flats are impossible. The Harp, because it has only seven notes in its octave, is essentially a diatonic instrument; chromatic passages are entirely unsuitable in any case, and may be unplayable. The best part of the compass is in the middle; the lowest strings are rather rough in tone and the highest are too short to be resonant.

2. NOTATION. The part is written like Piano music on two staves (treble and bass) braced, in real notes and with proper key-signatures. The terms "8va" and "8va bassa" may be used for the extremes of the compass. Everything for the right-hand must have tails turned up, and everything for the left-hand tails turned down, irrespective of compass position. Great care must be exercised in giving the exact length of each note, as the strings vibrate for some time unless damped out.

3. KEYS. Major keys are better than minor. As the flat notes have a greater length of string it follows that the flat keys are the better for the Harp. The extreme sharp keys should be written enharmonically, B major written as

C flat, F sharp major written as G flat, and C sharp major as D flat.

4. Duplication of Harps. Harps gain nothing by duplication in unison, but much by part-writing. If the part is simple, one Harp is sufficient. The advantage of having a second lies in the possibility of harmonic elaboration and of sudden harmonic changes, which by being divided between the players can make the music more continuous.

5. Homophones. These enharmonic unisons are nine in number, the missing notes of the twelve in the octave, C to C, being D, G,A, the three white notes which on the Piano lie between two black notes. A player can do much by means of homophones, provided always that he is given time to re-adjust the pedals.

6. Glissandos. These can be set by means of homophones for all minor ninths, some dominant sevenths, and parts of other chromatic chords. Major and minor scales are also possible, the tonal result being a cacaphony similar to that produced by playing scales on the Piano with the pedal down. In writing *glissandos* the point to remember is that every string must sound, so that every letter of the musical alphabet must be included either as

flat, natural or sharp. For example, for the chord, A,C,E flat, G flat, the pedals are set for A natural, B sharp, C natural, D sharp, E flat, F sharp, G flat.

The most effective *glissando* is long, four or five octaves, as the full sweep of the strings can be done in a second, and a slow *glissando* is an absurdity. Other kinds are (1) a series of short two-octave *glissandos* following each other quickly; (2) those done by both hands in similar or contrary motion; (3) those done by one hand, while the other has separate notes. In every case over-lapping of the hands must be avoided.

7. Chords and Arpeggios. The chief purpose in life for the Harp is to accompany; it is in no way a melodic instrument; chords and arpeggios therefore form its normal language and the more simple they are the better. They must be written as for the Piano, within the octave, and with never more than four notes for each hand. In general, in the upper part of the compass, the more notes there are and the closer together they lie, the better the effect. Close chords are always slightly spread, unless marked 'sec'., and this can only be applied to very small chords. Chords and arpeggios should never over-lap but keep straight on, up or down, hand over hand.

When both hands are playing arpeggios simultaneously there should always be a clear octave between the two parts.

8. HARMONICS. One only, the octave above the open string, can be got on each string, the effect being very soft and only good in a thin score. Harmonics are best standing alone, but chords of two or three notes close together are possible. They should never succeed each other quickly and must be confined within the compass of the great stave, the bass half being rather the better in tone. The modern notation is to write the open string with an "o" over it (as in Violin), but formerly the notes were sometimes written at their actual pitch.

59. SPECIAL EFFECTS. (1) *Shakes and Tremolo.* These are possible but sound stupid and clumsy, being foreign to the nature of the instrument. (2) *Étoufée*; the vibration is stopped as soon as the string is plucked, the result being an effect something like *pizzicato* on the Strings. (3) *Sul ponticello*, (or "*sons près la table*"); the string is plucked at the lower extremity, which has the effect of a Guitar. The contradiction in each case is "*sons naturel*," or "*s.n.*"

10. GENERAL. Harp writing is not difficult if three points are kept in mind; (1) the position of the harpist; (2) the similarity between Harp

playing and Piano playing ; and (3) the constant necessity for ample time between passages in order that the last notes played may be damped out and the pedals re-set for the next. The instrument rests on the right shoulder and is played from the treble end, consequently the right hand and arm are rather confined, and cannot stretch out so freely as the left. The left hand plays the low bass notes as on the Piano. Both hands should not be put low down for any length of time as this is extremely exhausting for the player. The little finger is never used, so only four notes can be played by each hand ; these should be written within the compass of an octave, though players with a big stretch can do a ninth or a tenth. A string needs to be plucked considerably out of the vertical, and is some time in regaining its normal position, so reiterated notes can only be done by means of homophones. When the pedals are being set there is inevitably a moment of silence. The Harp is a slow-speaking instrument, and becomes incoherent in a rapid passage. As on the Piano, quick repetitions should be avoided, also a great space between the hands. In thick chord work octaves are the best for the left-hand. The harmony of the Harp-part should be correct in itself, each chord having its true bass. Scales are not good, though quite play-

able. Nothing is gained in including the Harp in a ponderous *tutti*, or when there is much movement on the Strings, as it has no great force and cannot be heard. It is best suited to delicate passages, soft rather than loud, and to make movement in a mass of sustained tone.

Notes on some obsolete or rarely used instruments.

1. Bassett Horn. A tenor or alto Clarinet, built in F, with a technique similar to that of the ordinary Clarinet and the compass of the Viola. The part is written a perfect fifth higher than the real sound. There is also an alto Clarinet in E flat that is occasionally used.

2. Clarinet in C. A non-transposing Clarinet, rather smaller than the B flat instrument, which has fallen out of use on account of its bad tone.

3. Euphonium. A military bass brass instrument which occasionally strays into the orchestra ; the older form has three valves and the same compass as the tenor Trombone ; the modern instrument has a fourth valve which extends the compass down to the B flat below. It is easy to play and in military music is the principal bass solo voice.

4. Guitar. A part is sometimes found in modern scores for this essentially un-orchestral instrument. In pitch it comes between the Viola and the Cello. It has six strings, tuned in thirds and fourths, and the part is written in the treble clef an octave below the real sound.

5. Mandoline. This other un-orchestral instrument has the same tuning as the Violin, but its tone is too thin to penetrate through the modern orchestra, and parts written for it are generally played *pizzicato* on the Violins.

6. Oboe da Caccia. A wood instrument almost identical with the modern Cor Anglais, on which the part is now always played. Bach uses real notes in the alto clef, but as a rule the part used to be transposed in the manner of the modern Cor Anglais.

7. Oboe d' Amore. A mezzo-soprano Oboe, a minor third lower in pitch, with the same fingering. In tone and compass it comes midway between the Oboe and the Cor Anglais.

8. Ophicleide. A family of brass instruments, having holes and keys after the manner of the Wood Wind, which were last used by Mendelssohn, (M.N.D. Nos. IV and V), Wagner and Berlioz. They were easy to play and have fallen out of use chiefly on account of their defective intonation. The part is now generally played by the Bass Tuba.

9. Saxophone and Sarrusophone. Two families of French Wind instruments, invented by Sax and Sarrus respectively, which are made of brass and have a reed and finger mechanism like the English Wood Group.

The Saxophones have a single reed and resemble the Bass Clarinet in appearance; the Sarrusophones have a double reed and are nearly related to the Bassoons. Both groups are made in six sizes and all are transposing instruments. They are in general use in French military bands, and French composers sometimes include them in orchestral scores, but they are rarely seen in England.

10. SERPENT. A military bass Wood Wind instrument occasionally found in old scores. Its compass was from the A below the bass stave upwards for about three octaves, and the part was written a major second higher than the real sound.

11. VIOLA D' AMORE. This had the same compass and notation as the ordinary Viola, but possessed seven strings, tuned to the chord of D major. It had also a second series of "sympathetic" strings made of steel wire. It was too difficult to play, too un-dependable for ordinary use, and could only be given very simple parts. Its part is now played by the Viola.

12. VIOLA DA GAMBA. The old "Bass Viol," the predecessor of the Violoncello. It had six strings, tuned in fourths and thirds, and has not been used in the orchestra since the time of Bach.

ON THE STUDY OF OLD AND FOREIGN SCORES

In studying old scores it must always be remembered that the present conditions of orchestral balance are different from those for which the music was written. All instruments in the Orchestra, except only the Violin and the Tambourine, have changed in character more or less in the course of time, while many have ceased to exist ; with the result that their parts have of necessity to be played on others of the same pitch. Some have in the course of their development become more resonant, and others more delicate. The Wood Wind is far less powerful than it formerly was, but more beautiful, more refined in tone, and capable of a more elaborate technique. The Strings in a modern orchestra are stronger numerically than they used to be ; and these two things alone completely upset the balance of tone. The Brass instruments have also changed considerably, the tendency being always towards ease of execution and delicacy at the expense of tonal power. The Percussion is continually altering, both in make and in manner of use.

With regard to foreign scores, both old and

new, the point for consideration is that there has never been any exact international standardisation in musical matters. Each country, therefore, has developed its musical instrument trade independently; the result of this is that the instruments scored for by, say, a Russian or Italian composer are by no means necessarily the same that will play the parts in England or in France. Every orchestra in the world, in dealing with scores from other countries, has to adopt some system of compromise in their execution. Again, many composers (Wagner, for instance) have employed specially constructed instruments, not in ordinary use at all, but which had to be manufactured for them; parts written for such instruments have now of course to be played by others of the same pitch. Every text-book on Orchestration relates principally to the orchestras and to the instruments of its own country and its own time, which is the reason why there are so many contradictions between them in matters of detail.

The present arrangement of the full Score (Wood, Brass, Percussion, Voices or Solo parts, Strings) seems to be practically settled, although there is still room for logical improvement in the case of the Piccolo and the Horns. But

up to Wagner's time scores were arranged at pleasure; some have the Brass at the top and the Wood in the Middle; others have the Strings at the top, and so on. The student is generally most perplexed by the variety of transpositions in the Horn and Trumpet parts. Space does not allow for a full explanation of the reason for this, but briefly, it is this;—a tube can only produce one note (determined by its length) and the upper particles of that note. It follows therefore that without any sort of mechanism the "natural" Horn and Trumpet could each play only a few notes. To get over this difficulty the length of the tube itself was regulated by means of additional pieces of tubing called "crooks" or "shanks," there being one for each key, hence the term "in D," "in G," etc. To simplify the notation for the player (as the method of blowing remained unchanged) the part was always written in the key of C. Kettledrums also before Beethoven s time were treated in the same way. They were tuned always to the tonic and dominant of the principal key of the piece, the name of the key was stated at the beginning, and the part was written throughout with the notes C and G.

Explanation of the Horn and Trumpet parts of the Four Full Scores to be used with this book

HORN PARTS

Eroica. Beethoven keeps his three Horns crooked in the principal key (E flat) throughout, except in the case of the First and Third Horns in the Funeral March, which are crooked in C because the movement is in the key of C Minor. (The key of the piece was generally chosen, for the reason that it provided the instrument with more "open" notes). Because E flat is a major sixth below C, the part is written a major sixth higher than the real sound, so the very first chord played by the Horns is in unison with that played by the Violas. In the Funeral March the First and Third Horns play their first chord in unison with the Clarinets, the part "in C" sounding an octave lower than it is written.

M.N.D. Mendelssohn crooks his Horns in four ways for the five movements. Horn parts are invariably written higher than they sound, so the Second Horn s first note in the *Scherzo* is the D in the middle of the bass stave, thus providing the bass of the chord. In the *Intermezzo* a curious old anomaly appears;

formerly when the part got low, the bass clef was used, and *then* the part was written an octave too low, so the first C in octaves sounds the two As of the bass stave. The octave G, ten bars later, being in the treble clef, sounds the E (first line, unison with Second Violin) and the E below. In the Nocturne the part is written a minor sixth higher than the real sound (because E is a minor sixth below C,) and in the Wedding March it is written a perfect fourth above the real sound ,the first chord sounding F sharp, A.

PATHETIC SYMPHONY and SUITE. Tschaïkowsky, being a modern composer, writes only for the Horn in F.

TRUMPET PARTS

EROICA. The Trumpets are in E flat throughout, except in the second movement (Funeral March, in C Minor) where they are in C. The Trumpet in E flat sounds higher than it is written, so the first octave C sounds the two E flats in the treble stave. The Trumpet in C has no transposition at all.

M.N.D. The Trumpet in D in the Scherzo sounds a major second higher than written ; the first octave G (page 9) being in unison

with the first Violin. The Trumpets in the *Wedding March* sound as written.

PATHETIC SYMPHONY and SUITE. The Symphony begins with the Trumpet in B flat, and this has the same transposition as the B flat Clarinet. For the rest of the Symphony and the whole of the Suite the composer uses the A shank, which has the same transposition as the A Clarinet.

(Note). All Horn parts are written higher than they sound, and always have been. Trumpet parts vary; Trumpets in D, E flat, E and F are written lower than they sound, these four letters being above C in the musical alphabet; Trumpet in C has no transposition; Trumpets in B, B flat, and A are written higher than they sound, these three letters being below C in the alphabet.

TABLE OF INSTRUMENTS

Italian	German	French	English
Violino	Violine (or Geige)	Violon	Violin (or Fiddle)
Viola	Bratsche	Alto	Viola (or Tenor)
Violoncello	Violoncell	Violoncelle	Violoncello (or Cello)
Contrabasso	Kontrabass	Contre basse	Double Bass
Flauto	Flöte	Flûte	Flute
Ottavino	Kleine Flöte (or Pickelflöte)	Petite Flûte	Piccolo
Oboe	Oboe	Hautbois	Oboe (or Hautboy)
Corno Inglese	Englisches Horn	Cor Anglais	Cor Anglais
Clarinetto	Klarinette	Clarinette	Clarinet
Clarinetto basso (or Clarone)	Bass Klarinette	Clarinette basse	Bass Clarinet
Fagotto	Fagott	Basson	Bassoon
Contrafagotto	Kontrafagott	Contre-basson	Double Bassoon
Corno Ventile	Ventilhorn	Cor-à-pistons	Horn (or French Horn)
Tromba Ventile (or Clarino)	Ventiltrompete	Trompette-à-pistons	Trumpet
Cornetto	Cornett	Cornet-à- pistons	Cornet
Trombone	Posaune	Trombone	Trombone
Timpani	Pauken	Timbales	Kettledrums (or Drums)
Tamburo militaire	Kleine Trommel	Caisse claire (or Tambour)	Side Drum
Gran cassa	Grosse Trommel	Grosse Caisse	Bass Drum
Triangolo	Triangel	Triangle	Triangle
Piatti	Becken	Cymbales	Cymbals
Tamburino	Schillentrommel	Tambour de Basque	Tambourine
Campenetta	Glockenspiel	Carillon	Glockenspiel
Zilafone	Holzharmonik	Claquebois	Xylophone
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